

Diagnostic Engineering Publication

IBM POUGHKEEPSIE
December 31, 1964

1410/7010

Subject: Diagnostic Program T020C - Tape Operations Test
Sequence Number 201
Replaces T020B

T020 requires information about system and channel configuration in order to operate properly. The minimum information required, for use at installation time is described on Summary page 003, the last page of T020 documentation.

When running from cards be sure that the Standard System Control Card (T 020 001) is punched in accordance with instructions in the "1410/7010 Introduction", Vol. 1.00.

Reason for Change:

A problem existed in the routine to "Test for Erase Forward During Backspace After Write Status" under certain conditions.

1. When the length of tape erased was equal to the length of the record used in the test routine.
2. One pass of the test had been run and the first 1000 records on tape, written by the last routine run, all had labels of the form xxxx 00586*.

The following changes were made to T020B to create T020C: (All pages to which changes were made are dated 12/31/64)

1. The length of the second record written in the subject routine was changed from 586 characters to End of memory - 9400.
2. The tape record label used in all 586 character records (and End of Memory records) was redefined FROM: xxxx 00586* TO: xxxx 00586*.

Enclosures: 76 Pages

Card Deck for CARD ONLY SYSTEMS (as punched by UP51)
8 Cards - Card Loader (1-7) and 1 Core Clear
183 Cards No. 001 - 183 Data Cards
1 Card Execute Card

Distribution: X 1410 Tape
X 7010 Tape
Other

002
TOZO
late

001
T020
Page 001

T020C
TAPE OPERATIONS TEST
(1410/7010)
December 31, 1964

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4.00.00.0 TEST DESCRIPTION

.00.1 MODIFICATIONS

See Release Sheet description of changes from last level.

.00.2 DESCRIPTION

T020 tests magnetic tape operation instructions on a 1410 or 7010 Data Processing System. It is a test of electrical rather than mechanical operation.

The test covers three main areas:

- a. CPU channel circuitry, control and data lines to TAU.
- b. Tape Adapter Unit, control and data lines to drives.
- c. Tape Drive Write and Read circuitry.

These areas are by no means independent and are not completely testable separately. The test assumes that the CPU is functioning correctly and can at least decode a tape operation instruction.

Tape Units are tested sequentially, one channel at a time, on all channels. No simultaneous channel operation is performed. Overlap mode is used when the Overlap Feature is present. All tape instructions are then issued in overlap mode.

T020 can serve as a reliability test. Most instructions are used frequently enough to keep them under close surveillance.

The test is organized in building block fashion. Each block or section tests an additional area of tape operation. Each section is composed of one or more routines where each routine tests particular steps in the execution of the tape instruction. Although each routine depends on previously established operations, any routine can be run independently.

After each test routine, a monitor routine, labeled "MONITR", is entered to provide program control and report error conditions.
(Refer to flow chart Page 013.)

4.00.00.0 TEST DESCRIPTION

.00.2 DESCRIPTION Continued

Almost all tape operations are performed through the use of utility Write, Read and Unit Control Routines. These utility routines generate the particular instruction requested, set up the data field, execute the instruction, test the channel status indicators and test for overlapped and non overlapped operation.

For additional information on the utility Write, Read and Unit Control routines refer to OPERATING HINTS and COMMENTS section 4.00.03.3.

Automatic error correction routines are used if manual intervention does not prohibit their execution. The analysis of the results of each tape operation is made in the test routine initiating the instruction, and failure to meet expected results is recorded.
(Refer to flow chart, page 015.)

T020 begins immediately on completion of loading. No manual intervention is required. The program types its identity and the identity of each tape unit it is testing as they are selected. Success or failure indications are typed following the tape unit's identity. At completion of the test, an end of job message is typed, and T020 branches to the load program.

.00.3 EQUIPMENT REQUIRED

Any model

1410 or 7010

With

729s Mod II, IV, V, VI and/or 7330s.

Attached through

1414 Mods. 1, 2, or 7.

The Console Printer is the only output device employed.

.00.4 CARD DECK

T020 in card form consists of:

7 Cards	Load Program
1 Card	Core Clear
Program Deck ¹	Program T020
1 Card	Execute card (TADS) (Branch to 2000)

NOTE: Program card #001 is a STANDARD SYSTEM CONTROL CARD. It does not have any control information punched in columns 13 - 44.

.00.5 EC LEVEL OF MACHINE

1414 - 252643 (Permits backspacing into load point)

.00.6 PROGRAM RUN TIME

Approximately 3 minutes per tape drive for 729s.

4.00.01.0 LOADING PROCEDURES

Standard 1410 Diagnostic Loading Procedure is used. Refer to "1410/7010 Introductory Material" for further information.

4.00.02.0 OPERATING PROCEDURE

.02.1 Rewind and set to READY status tape drives to be tested.
(All READY tape drives from number 1 to number 9 are tested.
Drive 0 is not tested on any channel.)

Set ASTERISK INSERT switch to ON.

T020 begins immediately on completion of loading. No manual intervention is required.

Tape drives are tested sequentially. Each drive is tested to conclusion before the next one is selected.

All drives to be tested need not be READY when the test is begun. Additional tape units on a channel can be added in ascending sequence.

1. See Release Sheet for exact number of cards in program deck.

- .02.2 Program operation can be changed at any time using the "Program Alter Routine". TADs are loaded as blanks and TAD locations are only tested for 1.

The TADs used are:

Standard

<u>TADs</u>	<u>ADDR</u>	<u>NOT 1</u>	<u>1</u>
TAD0	01000	Do Not	Bypass Typeout
TAD1	01001	Do Not	Loop on Routine
TAD2	01002	Do Not	Halt on Error
TAD3	01003	Do Not	Repeat Program

Special

TAD4	01004	Do Not	Bypass Overlap Mode
TAD5	01005	Do Not	Halt after 1 I/O Operation
TAD6	01006	Do Not	Rewind Unload
TAD7	01007	Do Not	Perform LRCR Test
TAD8	01008	Do Not	Bypass Status Ind Typeout

T020 is run in overlap mode if the SYSTEM CONTROL CARD indicates the Overlap Feature is present. To change from overlap mode to unoverlap mode or from unoverlap to overlap mode, T020A must be restarted from 2000 after TAD4 is changed.

Setting TAD6 to 1 causes all the tape drives to rewind and unload (instead of just rewinding) after all the drives on a channel are tested.

To run the "LRCR Test" routine, set TAD7 to 1. The routine is run the first time it is encountered after TAD7 is set. It is then bypassed until the next channel is tested. For additional information on running the "LRCR Test" routine, refer to OPERATING HINTS & COMMENTS, section 4.00.03.5.

Setting TAD8 to 1 bypass Status Indicator Error typeouts only.

1. Longitudinal Redundancy Check Register (LRCR)

4.00.03.0 OPERATING HINTS AND COMMENTS

- .03.1 T020 tests all tape drives and channels that are READY (except drive C). To bypass a tape drive or channel, RESET the drive to Not READY or turn the TAU to OFF LINE. The same method is used to terminate operations on a drive or channel while the test is in progress. Caution is advised as resetting the drive status may cause the TAU to hang up. Resetting the drive (status) is safest in rewind status or while the console printer is typing. Several successive RESET-START operations may be necessary to "drop" a drive.
- .03.2 Drives are tested sequentially. After each drive is tested the drive number is set in a table, but it is not typed. The table is available for display at locations 00010 to 00019. Locations 00020 to 00024 contain the channels tested. These locations are labeled "RDYTDS" and "CHANOS" respectively.

Much additional and useful information is available in the index registers (X), (locations 00025 to 00099). It is organized in the following manner:

<u>X</u>	<u>ADDR</u>	<u>LABEL</u>	<u>CONTENTS</u>
1	00025	SXR1	Address - Next routine
2	00030	SXR2	Address - Last routine
3	00035	RETURN	Address - Return to test routine
4	00040	DATA	Address - Data field for Write
5	00045	RECLEN	Record length, Write & Read fields
6	00050	BBBBB	B. -Address, Indexed Write & Read
7	00055	XAREOT	B, E, F, G, H address after Write/Read
8	00060	SXR3	Used
9	00065	SXR4	in
10	00070	SXRA	utility
11	00075	SXRB	routines.
12	00080	-----	Not used.
13	00085	TDIND	T.D. number in Ready Table.
14	00090	CHIND	Channel number in Channel Table.
15	00095	CHSTCT	Position in table of channel constants.

The only input-output area is labeled BUFER and occupies locations 09400 to 09986.

.03.3 Most of the tape operations are performed through the use of Write, Read and Unit Control Routines. Each of the Write, Read and Unit Control Routines has multiple points of entry. The label of the entry to a routine determines the tape operation that is performed in the routine. The labels are the same as the Autocoder mnemonics of the tape instruction to be executed. Specifically, the labels of the points of entry, and therefore the operation performed in the routine are:

RWD, BSP, WTM, SKP	The Unit Control Routine
WT, WTB, WTW, WTBW, WTBEW	The Write Routine
RT, RTB, RTW, RTBW, RTBGW	The Read Routine

(The O is not used to indicate overlap mode)

For example:

1. B WTM

causes a Write Tape Mark instruction (UxUnM) to be set in the Unit Control Routine and executed.

2. B RTBW

causes a Tape Read instruction in odd parity, load mode, (LxBnbbsbbR), to be set into the Read Routine and performed.

The Write Routine requires that the branch to it be followed by a constant that is the address of a data field. The constant can be signed or unsigned. The Write Routine moves the data from the address specified to the common input-output area (labeled "BUFER"). The sign of the data address indicates the size of the output data field in the "BUFER".

CONSTANT	SIZE OF DATA FIELD
Unsigned	10 Characters
Signed minus (-)	64 Characters
Signed plus (+)	586 Characters

In each case, a group mark-word mark is placed immediately to the right of the last character of the data field in the "BUFER".

The 586 character records are composed of nine multiples of the 64 character data field addressed and a ten character record label. The record label contains the record number and the record length and is separated from the rest of the data field by a record mark (#). A typical record label is 064900586#. This is record number 649 and is 586 characters long.

The utility Write, Read and Unit Control Routines return control to the test routine from which they were entered after the operation is successfully completed. (Refer to Flow Chart, page 014.)

4.00.03.0 OPERATING HINTS AND COMMENTS Continued

- .03.4 Setting TAD5 to 1 causes a halt after each tape operation. The halt is located at a point where the Read, Write and Unit Control subroutines merge into a common routine. (Refer to flow chart, page 014.) This makes it possible to display the input-output area, indicators, address registers, etc. immediately after the operation is performed. (Preliminary setups can be performed at machine speed.)

NOTE: The halt occurs after each tape operation, Unit Control operations included. Wait for the console READ or WRITE light to be on before displaying the input-output area.

- .03.5 Pressing INQUIRY REQUEST before START on the Read phase of the "LRCR Test" routine causes a STOP after reading the first character. Setting TAD5 to 1 causes a STOP after each of the succeeding read operations. This permits a visual inspection of the TAU's CHECK register, LRCR REG and VRC REG.
- .03.6 In addition to the tests for inquiry requests (BNQs) strategically located in the program, a "BNQ" is placed within the "Program Alter Routine" itself. This permits altering more than one area of the program at one time without returning to a test routine to await the next "BNQ". To accomplish this, hold down INQUIRY REQUEST while pressing INQUIRY RELEASE.

4.00.04.0 PROGRAM STOPS AND RESTARTS

.04.1 STOPS

All programmed stops are under TAD control and occur only on request. ^{1.}

Setting TAD2 to 1 causes a halt on program detected errors. The halt is located in the "Error Control Routine" and is the only error halt used. It occurs after the error timeout and before any automatic action is taken on the error.

A STOP under control of TAD5 is provided to assist in machine debugging. Its use is explained in OPERATING HINTS & COMMENTS, section 4.00.03.4.

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1. There are two unique STOPS not directly under TAD control. The STOPS are in the "LRCR Test" routine following messages to set density switches. The routine is optional and under TAD control. The STOPS occur only when the "LRCR Test" routine is run.

.04.2 PROGRAM RESTARTS

After all STOPS, START causes the test to resume with the next sequential instruction. COMPUTER RESET and START returns the test to the start of the test routine in progress or the last test routine run before resetting. After the test is completed and "EOJ" is typed, COMPUTER RESET and START begins the test again at 2000.

4.00.05.0 TYPEOUTS

.05.1 NORMAL OR NON-ERROR TYPEOUTS

T020A Test Identification - typed once at the start of the test.
It is not retyped.

TU xx Tape Unit Identification - channel and drive number of unit
being tested. e.g. TU 12 Channel 1, Drive 2.

PASS Pass Complete - typed only on completion of all test routines on the selected tape unit. ^{1.}

.05.2 ERROR TYPEOUTS

All typeouts preceded by asterisks are error indication and are under TAD control. ^{2.}

Error typeouts are in four classes.

1. Reporting some Status Indicator set during operation when it should not have been (or was not expected.)
2. Reporting a failure to meet some predetermined condition, i.e., data fields fail to compare, an expected Status Indicator not set, address register at end of transfer not as expected, etc.
3. A "Not Ready", (1), indication or three successive errors in the first two routines (ERROR 01-ERROR 09) causes the testing of the drive to be terminated. This action is reported following the error typeout.
4. The B-register bit pick up and A-register drop-out test reports results in summary form. Only non zero totals are typed out.

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1. Not including "LR CR Test" routine which is optional.
 2. The summary typeouts of Class 4 are not under TAD control.

4.00.05.0 TYPEOUTS (Continued)

Illustrations and explanations of error typeouts:

1. Status Indicator Set

* M%B109400W 4 05000
 a b c

- a. Instruction issued - Write
- b. d-character bit of test and branch instruction used to test indicator -4- Data Check
- c. Starting address of routine in progress.
To repeat routine ADDRESS SET to this address. 1.

2. Some expected condition not met:

* ERROR 35 06000
 a b

- a. Error indication and code number for the condition not met. Refer to the program listing for explanation. (In the listing the error number is the label of a Set Word Mark instruction.)
- b. Starting address of routine.
To repeat routine ADDRESS SET to this address. 1.

3. Testing of tape drive terminated prematurely:

* DROPPED

4. The B-register bit pick up and A-register drop out test reports results in the manner:

*B 0325
*C-0980
* 1-1000
 a b c

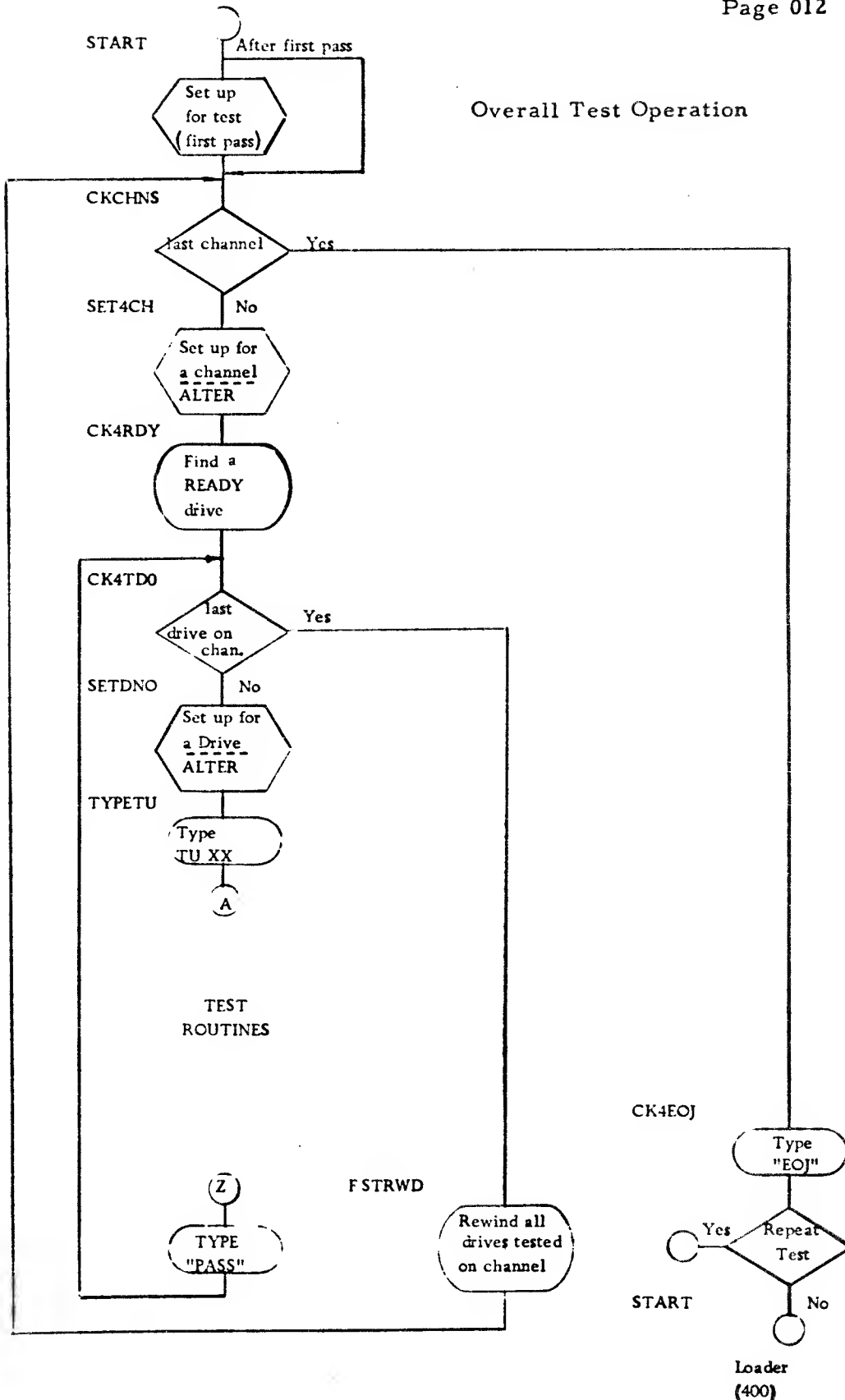
- a. Indicates bit (1248ABC).
- b. Blank indicates bits picked up; hyphen, (-), indicates bits dropped.
- c. Indicates number of bits picked up or dropped.

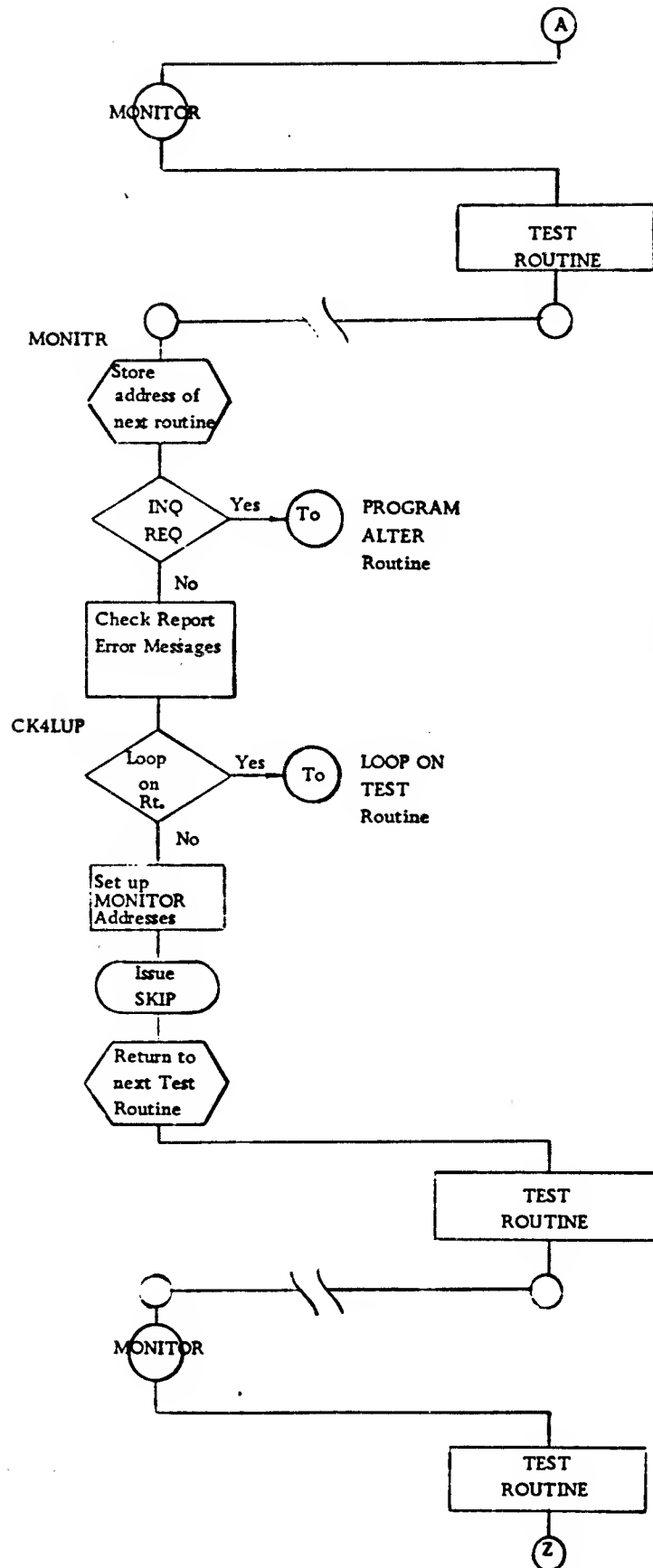
1. RESET-START can be used when TAD2 is set to STOP on error.

TAPE OPERATIONS TEST

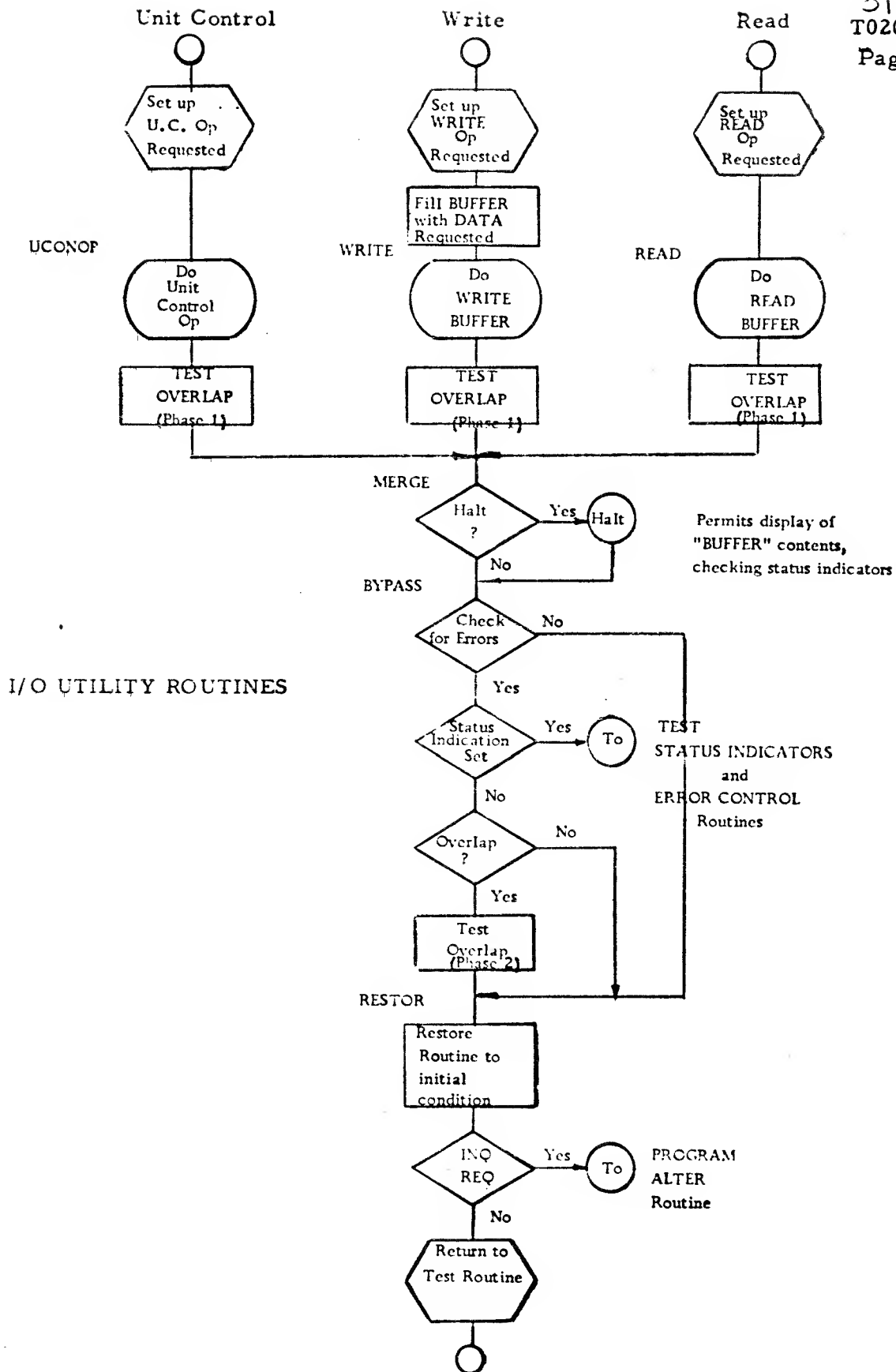
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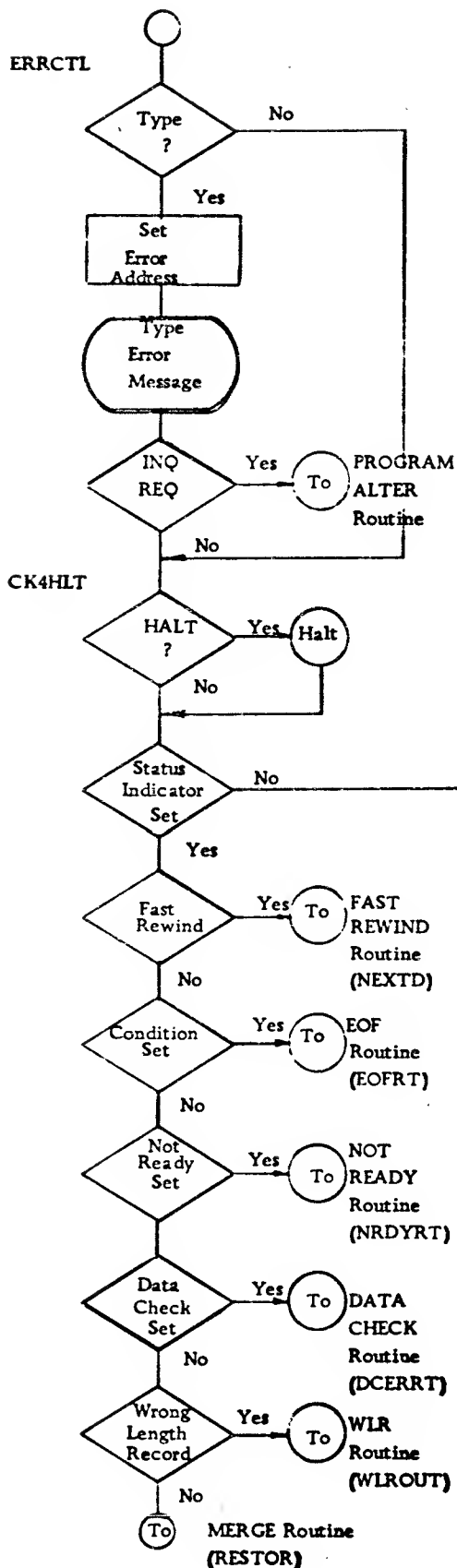
Overall Test Operation





Sequence of Test
Routines and common
MONITOR Routine





ERROR CONTROL ROUTINE

Entry from Status Indicator Test or Scan for Wms Error Routine.

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TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND
CTL	2	
LINES	36	
EQU	400	

MAX. LINES/PAGE 36

LOADER

LOC OF LOAD PROGRAM

• ASSIGN LABELS TO INDEX REGISTERS AND
• LOCATIONS IN STORAGE

CHSTCT	EQU	15,X	COUNT FOR CHAN SET UP
CHIND	EQU	14,X	INDICATES CHANNEL NUMBER
TDIND	EQU	13,X	DRIVE NUMBER IN READY TABLE
SXRB	EQU	11,X	UTILITY INDEX REG
SXRA	EQU	10,X	UTILITY INDEX REG
SXR4	EQU	9,X	UTILITY INDEX REG
SXR3	EQU	8,X	UTILITY INDEX REG
XAREOT	EQU	7,X	B/E/F/G/H ADDR AFTER READ/WRITE
BBB8B	EQU	6,X	B-ADDR FOR INDEXED READ/WRITE
RECLN	EQU	5,X	RECORD LENGTH
DATA	EQU	4,X	ADDR OF DATA FIELD
RETURN	EQU	3,X	ADDR OF RETURN TO TEST RT
SXR2	EQU	2,X	ADDR OF LAST ROUTINE - MONITR
SXR1	EQU	1,X	ADDR OF NEXT ROUTINE - MONITR
•			*****
ROYTDS	EQU	10	TABLE OF READY IDS
CHANDS	EQU	20	CHANNELS AVAILABLE
WKAREA	EQU	163	WORK AREA
BUFER	EQU	09400	INPUT-OUTPUT AREA
BUFER1	EQU	BUFER&10	
BUFER2	EQU	BUFER&74	LOC OF FIRST CHAR OF
BUFER3	EQU	BUFER&138	
BUFER4	EQU	BUFER&202	A GROUP, IN A RECORD
BUFER5	EQU	BUFER&266	MADE UP OF MULTIPLES
BUFER6	EQU	BUFER&330	
BUFER7	EQU	BUFER&394	OF A GROUP & A LABEL
BUFER8	EQU	BUFER&458	
BUFER9	EQU	BUFER&522	LAST CHAR IN BUFER
BUFRND	EQU	09985	

TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

LABEL OPCOD OPERANO

• ***** STANDARD TAOS *****

ORG 01000

01000

NOT 1

1

TAD0 2 2 00 NOT BYPASS TYPE OUTS

1 01000

TAD1 2 2 00 NOT LOOP ON ROUTINE

1 01001

TAD2 2 2 00 NOT HALT ON ERRORS

1 01002

TAD3 2 2 00 NOT REPEAT PROGRAM

1 01003

• ***** SPECIAL TAOS *****

TAD4 2 2 00 NOT BYPASS OVERLAP MOOE

1 01004

TAD5 2 2 00 NOT HALT AFTER 1 I/O OP

1 01005

TAD6 2 2 00 NOT REWIND UNLOAD

1 01006

TAD7 2 2 00 NOT PERFORM LRCR TEST

1 01007

TAD8 2 2 00 NOT BYPASS STATUS IND TYPEOUT

1 01008

GMWM 2 2 00 NOT

1 01009

• *** PROGRAM SET UP IN NOT 1 CONDITION ***

• AND WILL ONLY TEST FOR 1

• PROGRAM ALTER ROUTINE

CONTRL	SBR	CTLXITE5	STORE RETURN ADDRESS	7	01010	G	01084	B
ENTER	RCP	ADDRESS ⁴	ENTER LOCATION TO BE ALTERED	10	01017	M	X10	01052 R
	BEX1	ENTER,M	TRY AGAIN IF 1/2/4/8	7	01027	R	01017	M
	BNT1	CTLXIT	INQ NOT FROM CONSOLE	7	01034	R	01079	B
	BAL	ADDRES		7	01041	R	01048	M
ADDRES	RCPW	00000	ENTER DATA INTO ADDRES SPECIFIED	10	01048	L	X10	00000 R
	BEX1	ADDRES,M		7	01058	R	01048	M
	BAL	*E1		7	01065	R	01072	M
	BNO	ENTER	STAY HERE-ALTER MORE	7	01072	J	01017	Q
CTLXIT	B	00000	RETURN TO PROGRAM	7	01079	J	00000	
•			*****					

TAPE OPERATIONS TEST

T020 INSTRUCTION

CT ADDRS

OPCODE OPERAND

LABEL

ZERO	EQU	00000							
BPRIME	OCW	ZEROE88888							
EOMANI	DCW	09999							
WTEADR	DCW	09990							
BASE FOR INOEXD R/W									
								5	01125 00*-0
								5	01130
								5	01135
INOEXED R/W ADDRESS									
END OF MEMORY ADDRESS									
END OF MEMORY-10									
ALL STATUS IND									
LERROR	DCW	ERROR						5	01140
ALLIND	DCW	1248BA						6	01146
WMERCT	DCW	00						1	01147
OCCNT	DCW	00						1	01148
WLRcnt	DCW	00						1	01149
DATA CHECK COUNTER									
WLR COUNT									
RECORD COUNT									
RECN11	DCW	0000						4	01153
RECN12	DCW	0000						4	01157
HOLOIT	OCW	00000						5	01162
HAFOUN	OCW	OROPC						5	01167 08627
BPUCNT	OCW	00000						5	01172
COUNT0	EQU	DUMMY-6							
SAVEIT	OCW	0000						4	01176
BIT PICK UP COUNT									
A FIELD OF 4 ZEROS									
SAVE RECORD NUMBER									
LOOP TIME FOR SPACE, 1 SEC ON T.1.									
TIME1	OCW	06						2	01178
OLACNT	OCW	000000						6	01184
DELAY1	DCW	000000						6	01190
TISW	DCW	00						2	01192
OIPSW		00						2	01194
SWITCH LOCATIONS									
OVERLAP INDICATOR									
TEST PATTERN SEQUENCE									
	DC	WTFTPC						5	01199 09336
	DCW	WTFTPB						5	01204 09272
	OCW	WTFIPA						5	01209 09208
	OCW	WTFIPB						5	01214 09144
	OCW	WTFIP4						5	01219 09080
	DCW	WTFIP2						5	01224 09016
	OCW	WTFIP1						5	01229 08952
FREQ1	ORG	1289							01289
FOR A WRITE TRIGGER FREQUENCY									
TEST ROUTINE. PATTERNS ARE									
WRITTEN IN ASCENDING SEQUENCE									

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
*		• INSTRUCTION ALTERATION ROUTINE			
*		OP CODES, X-CONTROL FIELDS & D MODS			
*		ARE ALTERED ACCORDING TO CHAN REQ			
I-A-R	SBR	SXRA	7	01289	G 00074 B
	MLNA	4&SXRA, SXRB	12	01296	D 00.04 00079 /
IARSCN	SCNLB	09990, 0&SXRB	12	01308	U 09990 00.00 -
	SBR	SXRB	7	01320	G 00079 B
	C	SXRB, 9&SXRA	11	01327	C 00079 00.04
	BH	14&SXRA	7	01338	J 00.04 U
	MLCS	1&SXRB, *&12	12	01345	D 00.01 01368 3
	BCE	IAROP, IAROPS, 0	12	01357	B 01393 01503 0
	BCE		1	01369	B
	BCE		1	01370	B
	BCE	IARCSI	6	01371	B 01424
	BCE		1	01377	B
	BCE		1	01378	B
	BCE		1	01379	B
	BCE	IARJOP	6	01380	B 01443
	B	IARSCN	7	01386	J 01308
IARIOP	MLNS	13&SXRA, 4&SXRB	12	01393	D 00.03 00.04 1
	MLCS	10&SXRA, 2&SXRB	12	01405	D 00.00 00.02 3
	B	IARSCN	7	01417	J 01308
	MLCS	11&SXRA, 1&SXRB	12	01424	D 00.01 00.01 3
IARCSI	B	IARSCN	7	01436	J 01308
	MLCS	7&SXRB, *&12	12	01443	D 00.07 01466 3
IARJOP	BCE	IARBOL, IARDIS, 0	12	01455	B 01477 01507 0
	BCE		1	01467	B
	BCE		1	01468	B
	BCE		1	01469	B
	B	IARSCN	7	01470	J 01308
IARBOL	MLNS	12&SXRA, 7&SXRB	12	01477	D 00.02 00.07 1
	B	IARSCN	7	01489	J 01308
IAROPS	DCM	@J13XRULM@	8	01503	
IARDIS		34321@	4	01507	

TAPE OPERATIONS TEST

OPCODE OPERAND

LABEL

CT

ADDS

* CHANNEL CONSTANTS FOR ALTER ROUTINE-
 * CHAN OP CHAR- UNOVERLAP AND OVERLAP,
 * CHAN STATUS INDICATOR OP CODE,
 * CHAN BRANCH ON OLAP TEST D-MOD CHAR

CHCON	DC	00R10	CHANNEL 1	3	01508
	DCW	000	OVERLAP	1	01511
	DC	00X20	CHANNEL 2	3	01514
	DCW	000	OVERLAP	1	01515
	DC	00M30	CHANNEL 3	3	01518
	DCW	000	OVERLAP	1	01519
	DC	00'140	CHANNEL 4	3	01522
	DCW	000	OVERLAP	1	01523

GOPDS	DCW	00EFGH0	D MODS FOR G CCCCC X	4	01524
-------	-----	---------	----------------------	---	-------

* SET UP FOR CHANNEL TO BE TESTED

SET4CH	S	CHSTCT	ZERO CH STATUS COUNT	6	01528	S	00099
	S		ZERO CHAN COUNTER	1	01534	S	
CKCHNS	BCE	CK4EOJ,CHANOSCHIND,	LAST CH ON SYSTEM	12	01535	B	06603 00MKO
	MRC	CHCONECHSTCT,CHSTAT	SET CH CONS IN ALTER RT	12	01547	D	01EM8 01798 #
	BCE	UPSTCT,TAD4,1	UN-OVERLAP OPERATION	12	01559	B	01613 01004 1
	MRC	CHCONECHSTCT,CHSTAT	OVERLAPPED OP	12	01571	D	01EA1 01798 #
	MLCS	CHCONECHSTCT,TESTX1011	X1 CHAR FOR OL	12	01583	D	01EA1 07706 3
	CW	AREOTO	DONT G CCCCC D YET	6	01595	D	07917
	MLCS	GOPOSECHIND,AREOTO06	SET D MOD CHAR	12	01601	D	01EK4 07923 3
UPSTCT	A	FOUR,CHSTCT	UP COUNTER BY 4	11	01613	A	08701 00099
	MLNS	CHANOSCHIND,TUIDNO-1	SET CH # IN TAPE UNIT 1.D.	12	01624	D	00MKO 01831 1
	A	ONE,CHIND	UP 1 FOR NEXT CHAN	11	01636	A	08681 00094
	MLCS	CHSTAT,CKORIV01	SET UP WRITE INSTRUCTION	12	01647	D	01798 01735 3
	MLCS	CHSTAT01,CKORIV010	SET UP D-MOD FOR NOT RDY TEST	12	01659	D	01799 01744 3
	SW	LRCRCK01	SET TO RUN LRCR TEST ON 1 ORIVE	6	01671	D	02906

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND
CK4RDY	S	RDYTDSE9
	S	
	S	TDIND
	CW	CK4TD0E1
NEXTOR	A	ONE,ATDNO
CK4TDO	NOPWM	
	BZ	FSTRWD
	BZ	CKCHNS
	MLNS	ATDNO,UNITNO
CKDRIV	WT	IO,BUFER
	BNRI	NEXTOR
	MLNS	UNITNO,TDNO
	MLNS	UNITNO,TUIDNO
	SW	CK4TD0E1

CHECK FOR READY DRIVES ON A CHANNEL

LABEL	OPCODE	OPERAND	INSTRUCTION	CT	ADDRS
CK4RDY	S	RDYTDSE9	READY TABLE TO ZEROS	6	01677 S 00019
	S		ZERO TAPE DRIVE NO	1	01683 S
	S	TDIND	ZERO TAPE DRIVE CNTR	6	01684 S 00089
	CW	CK4TD0E1	SET SWITCH	6	01690 0 01708
NEXTOR	A	ONE,ATDNO	ADD 1 TO TD UNIT NO	11	01696 A 08681 00009
CK4TDO	NOPWM			1	01707 N
	BZ	FSTRWD	ALL DRIVES ON CHAN TESTED,RWD ALL	7	01708 J 06646 V
	BZ	CKCHNS	CHECK FOR NEXT CHANNEL	7	01715 J 01535 V
	MLNS	ATDNO,UNITNO	MOVE DRIVE NUMBER TO WRITE DP	12	01722 D 00009 01737 1
CKDRIV	WT	IO,BUFER	TRY TO WRITE A RECORD	10	01734 M 2U0 09400 W
	BNRI	NEXTOR	NDT RDY,SKIP IT	7	01744 R 01696 1
	MLNS	UNITNO,TDNO	SET TD NO TO ALTER TD	12	01751 D 01737 01801 1
	MLNS	UNITNO,TUIDNO	SET TAPE DRIVE # IN TYPEOUT	12	01763 D 01737 01832 1
	SW	CK4TD0E1	SET SWITCH	6	01775 , 01708

ALTER INSTRUCTIONS FOR DRIVE SELECTED

LABEL	OPCODE	OPERAND	INSTRUCTION	CT	ADDRS
ALTER	B	I-A-R	ALTER FOR CH REQUEST	7	01781 J 01289
	DCW	UPREND	ADDR. TO START SCAN	5	01792 08585
		TDNO	ADDR. TO STOP SCAN	5	01797 01801
CHSTAT	DC	0 0	I/O SPECIFIC MODE	1	01798
		0 0	CH-STATUS IND OP CDE	1	01799
	DCW	0 0	D-MOD TO TEST OVLAP	1	01800
TDNO	DCW	000	X-CTRL FIELD POS 3	1	01801
	BA1	0E1	RESET INTERLOCK	7	01802 R 01809 M
	RWD	IO	REWIND DRIVE	5	01809 U 2U0 R
	BA1	0-11	TRY AGAIN ON ANY INDICATOR	7	01814 R 01809 M
	B	TYPEIT	TYPE TAPE DRIVE IDENTIFICATION	7	01821 J 09344
TUIDNO	DCW	0TU 000,G	TAPE UNIT IDENTITY	5	01832
	B	BEGIN	BEGIN TEST ROUTINES	7	01834 J 02015

TAPE OPERATIONS TEST

OPCDD OPERAND

LABEL

CT ADDRS INSTRUCTION

• MONITOR ROUTINE

MONITR	SBR	SXR1	RETURN ADDRESS	7	01841	G 00029	H
	BA1	•E1	RESET I/O INTERLOCK	7	01848	R 01855	M
	BNQ	CONTRL	TO PROGRAM CONTROL ROUTINE	7	01855	J 01010	Q
	B	CK4WMS	CHECK FOR ERRORS	7	01862	J 08076	
CK4LUP	NOPWM			1	01869	N	
	B	UPDATEC12	BYPASS LOOP CHECK	7	01870	J 01932	
	BCE	WHICH1,TAD1,1	CHK FOR LOOP ON ROUT	12	01877	B 01896	01001 1
	B	UPDATE	BYPASS LOOP CHECK	7	01889	J 01920	
WHICH1	C	SXR1,SXR2	COMPARE ROUT ADDRS	11	01896	C 00029	00034
	SW	LRCRCK&1	SET TO LOOP ON LRCR CKS	6	01907	, 02906	
	BL	0&SXR2	LOOP ON ROUTINE	7	01913	J 000,0	T
UPDATE	MLNB	SXR1,SXR2	SET ADDR FOR LOOP RT	12	01920	U 00029	00034 J
	CW	CK4LUP&1	RESTORE LOOP ON RT	6	01932	□ 01870	
	S	WMERCT	ZERO ERROR COUNT	6	01938	S 01147	
	B	SKP	TO SKIP/ERASE ROUTINE	7	01944	J 06932	
	B	0&SXR1	RETURN	7	01951	J 000#0	
	H		DEFINE PRECEDING BRANCH LENGTH	1	01958	.	

	ORG	2000	PROGRAM STARTS HERE		02000		
START	NOP			1	02000	N	
	B	SETUP	INITIALIZATION	7	02001	J 09400	
REPEAT	B	SET4CH	SET UP FOR A CHANNEL	7	02008	J 01528	
			THEN SET UP FOR A DRIVE				
BEGIN	NOP		BEGIN TEST ROUTINES	1	02015	N	

• TEST DRIVES SEQUENTIALLY AS THEY ARE FOUND READY
 • DRIVE SHOULD BE AT L.P. OR ON WAY TO L.P.
 • AFTER REWINDING

TAPE OPERATIONS TEST

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LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
•		•TEST BACKSPACE OPERATION			
•		BSP AT LP-SPACE FORWARD-BSP TO LP			
BSP1ST	B	MONITR	7	02200	J 01841
BSP2	B	BSP	7	02207	J 06894
ERROR 06	BSP	11	5	02214	U XUL B
	SW	ERR06	6	02219	• 00207
	BCB1	•E7	7	02225	R 02238 2
	CW	ERR06	6	02232	• 00207
					DO NOT LEAVE ERROR SET ON
BSP3	B	MONITR	7	02238	J 01841
	CU	XUL,A	5	02245	U XUL A
	BEX1	•E8,B	7	02250	R 02264 B L
	BAL	•-18	7	02257	R 02245 M G
	B	BSP	7	02264	J 06894
	CW	BSPSW61	6	02271	• 02283
BSP4	BSP	11	5	02277	U XUL B
BSPSW	NOPWM		1	02282	N
	B	BSPBZY	7	02283	J 02315
	SW	BSPSW61	6	02290	• 02283
	BCB1	BSP4	7	02296	R 02277 2
ERROR 07	SW	ERR07	6	02303	• 00208
ERROR 08	SW	ERR08	6	02309	• 00209
BSPBZY	BEX1	•E14,B	7	02315	R 02335 B L
	BAL	BSP4	7	02322	R 02277 M G
	CW	ERR08	6	02329	• 00209
					DO NOT LEAVE ERROR SET ON
BSP5	B	MONITR	7	02335	J 01841
BSP6	B	BSP	7	02342	J 06894
ERROR 09	BSP	11	5	02349	U XUL B
	SW	ERR09	6	02354	• 00210
	BCB1	•E7	7	02360	R 02373 2
	CW	ERR09	6	02367	• 00210
					DO NOT LEAVE ERROR SET ON
•					*****
•		BACKSPACE MOVES TAPE BACKWARD - STOPS AT LP			

LABEL	OPCODE	OPERAND	TAPE OPERATIONS TEST	CT	ADDRS	INSTRUCTION
•			•TEST WRITE TAPE MARK OPERATION			
•			WTM-SPACE, TEST FOR TI ON, TURN TI OFF			
	B	MONITR		7	02373	J 01841
	BTI	•E1	TURN T.I. OFF IN CASE IT WAS ON	7	02380	J 02387 K
	B	WTM	WRITE A TAPE MARK	7	02387	J 06913
	B	BSP	BSP OVER TM	7	02394	J 06894
	B	SPACE	SPACE OVER TM	7	02401	J 06792
	BW	•E7, TISW	T.I. SENSED IN TIME	12	02408	V 02426 01192 I
ERROR 10	SW	ERR10	T.I. NEVER SET ON	6	02420	, 00211
ERROR 11	SW	ERR11	DIDNT TURN T.I. OFF	6	02426	, 00212
	BTI	•E7	TEST T.I. TO BE SURE ITS OFF	7	02432	J 02445 K
	CW	ERR11	DO NOT LEAVE ERROR SET ON	6	02439	□ 00212
•			•••••			
•			•TEST SPACE OPERATION			
•			SHOULD SPACE OVER ONE RECORD ONLY			
	B	MONITR		7	02445	J 01841
	B	WT	M XUN BUFER W	7	02452	J 07027
	DCW	TENGMS	TEN GROUP MARKS	5	02463	08680
	B	WTM	WRITE TAPE MARK	7	02464	J 06913
	B	BSP		7	02471	J 06894
	B	BSP		7	02478	J 06894
	B	SPACE		7	02485	J 06792
	BW	•E7, TISW-1	OK, -DID NOT BR ON TI	12	02492	V 02510 01191 I
ERROR 12	SW	ERR12		6	02504	, 00213
	B	SPACE	SPACE OVER TM	7	02510	J 06792
	BW	•E7, TISW	T.I. SENSED	12	02517	V 02535 01192 I
ERROR 13	SW	ERR13		6	02529	, 00214
•			•••••			
•			SPACE MOVES OVER ONLY ONE RECORD			

TAPE OPERATIONS TEST

LABEL OPCOD OPERAND

CT ADDR INSTRUCTION

T020

* *TEST ERASE/SKIP OPERATION

B	MONITR				7	02535	J 01841
B	WTM	WRITE TM			7	02542	J 06913
B	WTM	WRITE TM			7	02549	J 06913
B	SKF	TO SKIP/ERASE ROUTINE			7	02556	J 06932
B	WTM	WRITE ANOTHER TM			7	02563	J 06913
B	BSP				7	02570	J 06894
B	BSP				7	02577	J 06894
B	BSP				7	02584	J 06894
B	SPACE	SPACE OVER TM			7	02591	J 06792
BW	*E7,TISW	T.I. SENSED			12	02598	V 02616 01192 H
ERROR 14	SW	ERR14			6	02610	, 00215
B	SPACE				7	02616	J 06792
BW	*E7,TISW				12	02623	V 02641 01192 H
ERROR 15	SW	ERR15			6	02635	, 00216
MLNA	DLACNT,DELAY1	SAVE DELAY 1 COUNT			12	02641	D 01184 01190 /
A	DELAY1	DOUBLE DELAY COUNT			6	02653	A 01190
A	DLACNT,DELAY1				11	02659	A 01184 01190
B	SPACE	SPACE OVER 2ND TM			7	02670	J 06792
BW	*E7,TISW	T.I. SENSED			12	02677	V 02695 01192 1
ERROR 16	SW	ERR16			6	02689	, 00217
C	DELAY1,DLACNT	COMPARE TIME INTERVAL			11	02695	C 01190 01184
BH	*E7				7	02706	J 02719 U
ERROR 17	SW	ERR17			6	02713	, 00218

SKIP/ERASE WORKS

TAPE OPERATIONS TEST

[illegible][illegible]

• •
•

B	MONITR		7	02719	J	01841
B	WTH	WRITE A TAPE MARK	7	02726	J	06913
B	BSP	BSP OVER TM	7	02733	J	06894
SW	BYPASSEL	DO ERROR CHECKING HERE	6	02740	Y	07651
B	RT	RD TM M XUN BUFR R	7	02746	J	07420
BEF1	*E7	CONOITION SET, OK	7	02753	R	02766 8
ERROR 20	SW	ERR20	6	02760	Y	00221
BWL1	*E7	WLR SHOULD BE SET	7	02766	R	02779 -
ERROR 21	SW	ERR21	6	02773	Y	00222
BEX1	*E8,X	ANY OTHER IND SET	7	02779	R	02793 X
B	*E7		7	02786	J	02799
ERROR 22	SW	ERR22	6	02793	Y	00223

●●●●●

• READ IM ODD PARITY,TEST FOR EOF & DC

• ALSO 1ST TEST OF ODD RED LATCH

8	MONITR		7	02799	J 01841
SW	AREOTO	SAFE TO STORE E NOW	6	02806	Y 07917
B	WIM	WRITE A TAPE MARK	7	02812	J 06913
B	BSP	BSP OVER TM	7	02819	J 06894
SW	BYPASSEL	OO ERROR CHECKING HERE	6	02826	Y 07651
B	RTB	RO TM M XBN BUFR R	7	02832	J 07438
BEF1	*E7	CONDITION SET, OK	7	02839	R 02852 8
ERROR 23	SW	ERR23	6	02846	Y 00224
BWL1	*E7	WLR SHOULD BE SET	7	02852	R 02865 -
ERROR 24	SW	ERR24	6	02859	Y 00225
BER1	*E7	DC SHOULD BE SET	7	02865	R 02878 4
ERROR 25	SW	ERR25	6	02872	Y 00226
BEX1	*E8,T	TEST FOR ANY OTHERS	7	02878	R 02892 1
B	*E7		7	02885	J 02898
ERROR 26	SW	ERR26	6	02892	Y 00227

TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

OPCOD OPERAND

LABEL

*LRCR TEST

WRITE AT 200 BPI - 1 2 4 8 A B C

B MONITR

7 02898 J 01841

LRCRCK NOPWM

1 02905 N

BCE

*E8,TAD7,1

BYPASS IF TAD NOT SET

12 02906 B 02925 01007 1

B

NOLRCR

BYPASS LRCR TEST

7 02918 J 03185

CW

LRCRCK&1

DONT REPEAT IIL NEXT CHAN

6 02925 D 02906

B

RWD

REWIND

7 02931 J 06875

B

TYPEIT

7 02938 J 09344

DCW

@SET TO 200 BPI@,G SET DENSITY SWITCH

14 02958

H

1 02960

CS WKAREA

6 02961 / 00163

MLCHS

GMWM,WKAREA-62

12 02967 D 01009 00101 7

SW

ALBIT&1

SET STARTING ADDR IN INDEX REG

6 02979 / 09344

SAR

SXR4

7 02985 G 00069 A

SEINXT

MLCS

0&SXR4,WKAREA-63

SET UP CHARACTER

12 02992 D 0040 00100 3

SAR

SXR4

7 03004 G 00069 A

B

WTB

7 03011 J 07045

DCW

-WKAREA

DATA TAKEN FROM HERE

5 03022 00163

BW

SEINXT,1&SXR4

WRITE 1 2 4 8 A B C BITS

12 03023 V 02992 0041 1

TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

OPCODE OPERAND

LABEL

• LRCR TEST ROUTINE CONTINUED
• READ AT 556 BPI

	B	RWD	REWIND	7	03035	J 06875
	B	TYPEIT		7	03042	J 09344
	DCW	QSET TO 556 BPI, G	SET DENSITY SWITCH	14	03062	
	H		SET TADS TO 1 FOR STOP	1	03064	.
	S	RECNT1	ZERO RECORD COUNT	6	03065	S 01153
CKALL7	BCE	NOLRCR, RECNT1, 7	ALL DONE	12	03071	B 03185 01153 7
	SW	BYPASSEL	DO ERROR CHECKING HERE	6	03083	, 07651
	B	RTB		7	03089	J 07438
	A	ONE, RECNT1	ADD TO COUNT	11	03096	A 08681 01153
	BER1	*E7	BETTER GET DATA CHK	7	03107	R 03120 4
ERROR 90	SW	ERR90		6	03114	, 00291
	BCE	*E8, BUFR, *	CHARACTER MUST NOT BE AN *	12	03120	B 03139 09400 *
	B	*E7		7	03132	J 03145
ERROR 91	SW	ERR91		6	03139	, 00292
	BEX1	*E8, Z	BRANCH ON A/8/1	7	03145	R 03159 2
	B	*E7		7	03152	J 03165
ERROR 92	SW	ERR92		6	03159	, 00293
	SW	CK4LUP&1	DONT LOOP HERE	6	03165	, 01870
	B	MONITR		7	03171	J 01841
	B	CKALL7		7	03178	J 03071

TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

OPCODE OPERAND

LABEL

• *TEST END OF XFER ON WRITE AND READ
 • WRITE 10 CHAR RECORD- READ INTO 10 CHAR AREA

NOLRCR	B	MONITR	7	03185	J 01841
	CW	TENGMS	6	03192	D 08680
	B	WT	7	03198	J 07027
	DCW	TENGMS	5	03209	08680
	C	XAREOT,C09411	11	03210	C 00059 01115
	BE	*E7	7	03221	J 03234 S
ERROR 27	SW	ERR27	6	03228	* 00228
	B	BSP	7	03234	J 06894
	B	RT	7	03241	J 07420
	C	XAREOT,C09411	11	03248	C 00059 01115
	BE	*E7	7	03259	J 03272 S
ERROR 28	SW	ERR28	6	03266	* 00229

• WRITE 10 CHAR RECORD- READ INTO 9 CHAR AREA

	B	MONITR	7	03272	J 01841
	CW	TENGMS	6	03279	D 08680
	B	WT	7	03285	J 07027
	DCW	TENGMS	5	03296	08680
	B	BSP	7	03297	J 06894
	MLNA	C00009,RECLEN	12	03304	D 01090 00049 /
	SW	BYPASSE1	6	03316	* 07651
	B	RT	7	03322	J 07420
	C	XAREOT,C09410	11	03329	C 00059 01110
	BE	*E7	7	03340	J 03353 S
ERROR 29	SW	ERR29	6	03347	* 00230
	BWL1	*E7	7	03353	R 03366 -
ERROR 30	SW	ERR30	6	03360	* 00231 W
	BEX1	*E8,S	7	03366	R 03380 S
	B	*E7	7	03373	J 03386
ERROR 31	SW	ERR31	6	03380	* 00232

TAPE OPERATIONS TEST

WRITE 9 CHAR RECORD-READ INTO 10 CHAR AREA

OPCODE OPERAND

LABEL

CT ADORS INSTRUCTION

TO20

8	MONTR		7	03386	J 01841
SW	TENGMS	SET WM TO TEST EOT	6	03393	, 08680
B	WT		7	03399	J 07027
DCW	TENGMS		5	03410	08680
C	XAREOT,C09410	COMP ADDR REG TO 09410	11	03411	C 00059 01110
BE	*E7	S/B EQU TO GMM & 1 ?	7	03422	J 03435 S
32	SW		6	03429	, 00233
B	ERR32		7	03435	J 06894
B	BSP		6	03442	, 07651
SW	BYPASS&1	ERROR CHECKING HERE	7	03448	J 07420
B	RT		11	03455	C 00059 01110
C	XAREOT,C09410	COMP ADDR REG TO 09410	7	03466	J 03479 S
BE	*E7	S/B EQU TO GMM & 1	6	03473	, 00234
33	SW		7	03479	R 03492 -
BWL1	ERR33	WLR SHOULD BE SET	6	03486	, 00235
B	*E7		7	03492	R 03506 5
34	SW	CHECK FOR NR & DC	7	03499	J 03512
BEX1	*E8,5		6	03506	, 00236
B	*E7		6	03512	0 08680
35	SW	BE SURE NO WM			
CW	TENGMS	*****			

TAPE OPERATIONS TEST

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LABEL OPCOD OPERANO

CT ADDR INSTRUCTION

* TEST NORMAL READ & WRITE AT EOM

B	MONITR				
MLNA	WTEADR,88888	SET ADDR IN X-REG	7	03518	J 01841
CS	9&88888	CLEAR TOP 10 LOCS	12	03525	D 01135 00054 /
MLCS	TENGMS,9&88888	MOVE 10 GMS TO EOM	6	03537	/ 00+.9
MLCS			12	03543	0 08680 00+.9 3
MLCS			1	03555	D
MLCS			1	03556	D
MLCS			1	03557	0
MLCS			1	03558	D
MLCS			1	03559	0
MLCS			1	03560	D
MLCS			1	03561	D
MLCS			1	03562	0
MLCS			1	03563	D
SW	BPRIMW&1	SET SW TO MDO WT ADR	6	03564	, 07345
B	WT	WRITE FROM MDO ADR	7	03570	J 07027
OCW	DUMMY	DUMMY WRITE FIELD	5	03581	08760
C	XAREOT,EDMAN1	CHK FOR EOM & 1	11	03582	C 00059 01130
BE	*&7		7	03593	J 03606 S
ERROR 36	SW		6	03600	, 00237
B	BSP		7	03606	J 06894
CS	9&88888	CLEAR TOP 10 LOCS	6	03613	/ 00+.9
SW	BPRIMR&1	SET SW TO MDO RT ADR	6	03619	, 01562
B	RT	READ INTO MDO ADR	7	03625	J 07420
C	XAREOT,EDMAN1	CHK FOR EOM & 1	11	03632	C 00059 01130
BE	*&7		7	03643	J 03656 S
ERROR 37	SW		6	03650	, 00238

LABEL	OPCODE	OPERAND	TAPE OPERATIONS TEST	CT	ADDRS	INSTRUCTION	T020
*		TEST WRONG LENGTH SPECIFICALLY					
*		FORCE WLR BY WRAP A ROUND					
	B	MONITR		7	03656	J 01841	
	MLNA	WTEADR,B888B	SET ADDR IN X-REG	12	03663	D 01135	0005
	CS	9E8888B	CLEAR TOP 10 LOCS	6	03675	/ 00E79	
	MLCS	TENGMS,9E8888B	MOVE 10 GMS TO EOM	12	03681	D 08680	00E7
	MLCS			1	03693	D	
	MLCS			1	03694	D	
	MLCS			1	03695	D	
	MLCS			1	03696	D	
	MLCS			1	03697	D	
	MLCS			1	03698	D	
	MLCS			1	03699	D	
	MLCS			1	03700	D	
	MLCS			1	03701	D	
	SW	BPRIMW61	SET SW TO MOD WT ADR	6	03702	, 07345	
	B	WT	WRITE FROM MOD ADDR	7	03708	J 07027	
	DCH	DUMMY	DUMMY WRITE FIELD	5	03719	08760	
	B	BSP		7	03720	J 06894	
	CS	9E8888B	CLEAR TOP 10 LOCS	6	03727	/ 00E79	
	A	ONE,B888B	FORCE WLR BY RAPARND	11	03733	A 08681	0005
	SW	BPRIMR61	SET SW TO MOD RT ADR	6	03744	, 07562	
	SW	BYPASS61		6	03750	, 07651	
	B	RT	READ INTO MOD ADDR	7	03756	J 07420	
	C	XAREUT,EOMAN1	CHK FOR EUM & 1	11	03763	C 00059	0113
	BE	*E7		7	03774	J 03787	S
ERROR 38	SW	ERR38		6	03781	, 00239	
	BWL1	*E7	S/B SET ON RAP-A-RND	7	03787	R 03800	-
ERROR 39	SW	ERR39		6	03794	, 00240	W
	8EX1	*E8,S	ANY OTHER IND SET	7	03800	R 03814	S
	B	*E7		7	03807	J 03820	
ERROR 40	SW	ERR40		6	03814	, 00241	

TAPE OPERATIONS TEST

TOTOPAGE 36

LABELOPCODOPERAND

CTADDRSINSTRUCTION

FORCE WLR BY FALLING 1 CHAR SHORT

B	MONITR			7	03820	J 01841
MLNA	WTEADR,00000	SET ADDR IN X-REG		12	03827	D 01135 00054 /
CS	9000000	CLEAR TOP 10 LOCS		6	03839	/ 00000
MLCS	TENGMS,9000000	MOVE 10 GMS TO EOM		12	03845	D 08680 00000 3
MLCS				1	03857	D
MLCS				1	03858	D
MLCS				1	03859	D
MLCS				1	03860	D
MLCS				1	03861	D
MLCS				1	03862	D
MLCS				1	03863	D
MLCS				1	03864	D
MLCS				1	03865	D
SW	BPRIMW01			6	03866	, 07345
B	WT	WRITE FROM MOD ADDR		7	03872	J 07027
DCH	DUMMY	DUMMY WRITE FIELD		5	03883	08760
B	BSP			7	03884	J 06894
CS	9000000	CLEAR TOP 10 LOCS		6	03891	/ 00000
S	ONE,00000	FORCE WLR ON 1 SHORT		11	03897	S 08681 00054
SW	BPRIMW01			6	03908	, 07562
SW	BYPASSE01	CHECKING DONE HERE		6	03914	, 07651
B	RT	READ INTO MOD ADDR		7	03920	J 07420
C	XAREOT,EOMAN1	CHK FOR EOM & 1		11	03927	C 00059 01130
BE	*07			7	03938	J 03951 S
ERROR 41	SW	ERR41		6	03945	, 00242
	DWLI	*07		7	03951	R 03964 -
ERROR 42	SW	ERR42		6	03958	, 00243
	BEXI	*08,S		7	03964	R 03978 S
	B	*07		7	03971	J 03984
ERROR 43	SW	ERR43		6	03978	, 00244

TAPE OPERATIONS TEST

LA3EL	OPC00	OPERAND	CT	ADDRS	INSTRUCTION
•		*TEST WRITE TO-READ TO END OF MEMORY			
	B	MONITR	7	03984	J 01841
	MLNA	WTEADR,88888	12	03991	U 01135 00054 /
	CS	9E88888	6	04003	/ 004.9
	MLCS	TENCMS,9E88888	12	04009	D 08680 004.9 3
	MLCS		1	04021	D
	MLCS		1	04022	D
	MLCS		1	04023	D
	MLCS		1	04024	D
	MLCS		1	04025	D
	MLCS		1	04026	D
	MLCS		1	04027	D
	MLCS		1	04028	D
	MLCS		1	04029	D
	SW	4E88888	6	04030	, 004.4
	SW	BPRIMWEL	6	04036	, 07345
	B	WTEW	7	04042	J 07099
	DCW	DUMMY	5	04053	08760
	C	XAREOT,EOMAN1	11	04054	C 00059 01130
	BE	*E7	7	04065	J 04078 S
ERROR 45	SW	ERR45	6	04072	, 00246
	B	BSP	7	04078	J 06894
	CS	9E88888	6	04085	/ 004.9
	MLCWS	GMWM,5E88888	12	04091	D 01009 004.5 7
	SW	BPRIMR&1	6	04103	, 07562
	B	RTBGW	7	04109	J 07492
	C	XAREOT,EOMAN1	11	04116	C 00059 01130
	BE	*E7	7	04127	J 04140 S
ERROR 46	SW	ERR46	6	04134	, 00247

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRES	INSTRUCTION
*		*TEST ADDRESS REGISTER AT END OF TRANSFER			
*		WRITE 64 CHARACTER RECORD			
*		READ BACK WITH READ TO END OF MEMORY			
	B	MONTR	7	04140	J 01841
	B	WTB	7	04147	J 07045
	DCW	-ALTBIT	5	04158	08888
	B	BSP	7	04159	J 06894
	MLNA	CO0586,RECLN	12	04166	D 01105 00049 /
	SW	BYPASSE1	6	04178	* 07651
	B	RTBGW	7	04184	J 07492
	C	XAREOT,C09465	11	04191	C 00059 01120
	HE	*E7	7	04202	J 04215 S
ERROR 47	SW	ERR47	6	04209	* 00248
	BWL1	*E7	7	04215	R 04228 -
ERROR 48	SW	ERR48	6	04222	* 00249 S
	BEX1	*E8,M	7	04228	R 04242 M
	B	*E7	7	04235	J 04248
ERROR 49	SW	ERR49	6	04242	* 00250
*					*****
G0210K	NOPWM		1	04248	N
	B	ODEVN1	7	04249	J 10000
*					*****

TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

OPCOD OPERAND

LABEL

* *FIRST TEST OF WRITE-READ DATA LINES
* CHECK DATA LINES USED IN TM

NEXTRT	B	MONITR		7	04256	J 01841
	B	WT	M XUN BUFR W	7	04263	J 07027
	DCW	TEN1S	DATA FIELD IN BUFR	5	04274	08690
	B	WT		7	04275	J 07027
	DCW	TEN2S		5	04286	08700
	B	BSP	NORMAL BACKSPACE	7	04287	J 06894
	B	BSP		7	04294	J 06894
	B	RT	M XUN BUFR R TEN 1S	7	04301	J 07420
	C	BUFR<9,TEN1S		11	04308	C 09409 08690
	BE	*<7		7	04319	J 04332 S
ERROR 50	SW	ERR50		6	04326	, 00251
	B	RT	READ TEN 2S	7	04332	J 07420
	C	BUFR<9,TEN2S		11	04339	C 09409 08700
	BE	*<7		7	04350	J 04363 S
ERROR 51	SW	ERR51		6	04357	, 00252
	B	MONITR		7	04363	J 01841
	B	WT		7	04370	J 07027
	DCW	TEN4S		5	04381	08710
	B	WT		7	04382	J 07027
	DCW	TEN8S		5	04393	08720
	B	BSP		7	04394	J 06894
	B	BSP		7	04401	J 06894
	B	RT	READ TEN 4S	7	04408	J 07420
	C	BUFR<9,TEN4S		11	04415	C 09409 08710
	BE	*<7		7	04426	J 04439 S
ERROR 52	SW	ERR52		6	04433	, 00253
	B	RT	READ TEN 8S	7	04439	J 07420
	C	BUFR<9,TEN8S		11	04446	C 09409 08720
	BE	*<7		7	04457	J 04470 S
ERROR 53	SW	ERR53		6	04464	, 00254

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRESS	INSTRUCTION
*		*WRITE & READ THE COLLATING SEQUENCE			
*		MOVE & LOAD MODE, EVEN & ODD PARITY			
	B	MONTR	7	04470	J 01841
	B	WT	7	04477	J 07027
	DCW	-COLSEQ	5	04488	08824
	B	WTB	7	04489	J 07045
	OCW	-COLSEQ	5	04500	08824
	B	BSP	7	04501	J 06894
	B	BSP	7	04508	J 06894
	B	RT	7	04515	J 07420
	C	BUFER&63,COLSEQ	11	04522	C 09463 08824
	BU	*&7	7	04533	J 04546 /
ERROR 55	SW	ERK55	6	04540	, 00256
	MLCS	COLSEQ-44,BUF&63,RESTORE S/B CHAR	12	04546	D 08780 09414 3
	C	BUFER&63,COLSEQ	11	04558	C 09463 08824
	BE	*&7	7	04569	J 04582 S
ERROR 56	SW	ERR56	6	04576	, 00257
	B	RTB	7	04582	J 07438
	C	BUFER&63,COLSEQ	11	04589	C 09463 08824
	BE	*&7	7	04600	J 04613 S
ERROR 57	SW	ERR57	6	04607	, 00258
	B	MONTR	7	04613	J 01841
	B	WTBW	7	04620	J 07081
	OCW	-COLSEQ	5	04631	08824
	B	BSP	7	04632	J 06894
	B	RTBW	7	04639	J 07474
	C	BUFER&63,COLSEQ	11	04646	C 09463 08824
	BE	*&7	7	04657	J 04670 S
ERROR 58	SW	ERR58	6	04664	, 00259

043

TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

OPCODE OPERAND

LABEL

* WRITE MOVE READ LOAD-CHECK FOR WS-WM

B	MONITR			7	04670	J	01841
B	WTB			7	04677	J	07045
DCM	-COLSEQ			5	04688		08824
B	BSP			7	04689	J	06894
SW	BYPASS&1			6	04696	,	07651
B	RTHW			7	04702	J	07474
BWL1	*&7			7	04709	R	04722 -
ERROR 59	SW	ERR59		6	04716	,	00260
BCE	*&7,BUFER&63,		LAST CHAR A BLANK	12	04722	B	04740 09463
ERROR 60	SW	ERR60		6	04734	,	00261
SW	COLSEQ-46		SET WM FOR COMPARE	6	04740	,	08778
C	BUFER&62,COLSEQ		COMPARE DATA	11	04746	C	09462 08824
BE	*&7			7	04757	J	04770 S
ERROR 61	SW	ERR61		6	04764	,	00262
CW	COLSEQ-46		RESTORE TO URIG CONO	6	04770	D	08778
C	BUFER&15,COLSEQ-48		COMPARE DATA	11	04776	C	09415 08776
BE	*&7			7	04787	J	04800 S
ERROR 62	SW	ERR62		6	04794	,	00263

*

TAPE OPERATIONS TEST

LABEL OPCOD OPERAND

CT ADDR INSTRUCTION

*SET WMS OVER COLLATING SEQUENCE
 WRITE MOVE-READ LOAD,-TEST FOR WMS
 WRITE LOAD-READ LOAD,-TEST FOR WMS

B	MONITR		7	04800	J 01841
CS	WKAREA	CLEAR OUT WORK AREA	6	04807	/ 00163
MLCA	COLSEQ,WKAREA	MOVE COL SEQ TO MOD	12	04813	D 08824 00163 1
SW	WKAREA-15,WKAREA-31	SET WMS	11	04825	, 00148 00132
SW	WKAREA-46,WKAREA-47	IN RECORD	11	04836	, 00117 00116
B	WTB		7	04847	J 07045
DCW	-WKAREA	COL SEQ WITH WMS	5	04858	00163
B	WTBW		7	04859	J 07081
DCW	-WKAREA		5	04870	00163
B	BSP		7	04871	J 06894
B	BSP		7	04878	J 06894
B	RTB		7	04885	J 07438
C	BUFER&63,COLSEQ	NO WMS HERE	11	04892	C 09463 08824
BE	*&7		7	04903	J 04916 S
ERROR 63	SW	ERR63	6	04910	, 00264
B	RTBW		7	04916	J 07474
BW	*&7,BUFER&17	CHECK FOR WM	12	04923	V 04941 09417 1
ERROR 64	SW	ERR64	6	04935	, 00265
BW	*&7,BUFER&32	CHECK FOR WM	12	04941	V 04959 09432 1
ERROR 65	SW	ERR65	6	04953	, 00266
BW	*&7,BUFER&48	CHECK FOR WM	12	04959	V 04977 09448 1
ERROR 66	SW	ERR66	6	04971	, 00267
CW	BUFER&17	CLEAR WM	6	04977	U 09417
CW	BUFER&32,BUFER&48	CLEAR WMS	11	04983	U 09432 09448
C	BUFER&63,COLSEQ	COMPARE DATA	11	04994	C 09463 08824
BE	*&7		7	05005	J 05018 S
ERROR 67	SW	ERR67	6	05012	, 00268

TAPE OPERATIONS TEST

LABEL OPCOD OPERAND CT ADDR INSTRUCTION T020

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*      *CHECK OPERATION OF 1 ST CHAR. LATCH
*      READ RECORD 1 ST CHAR TAPE MARK

      B  MONITR
      B  WT      M XUN BUFR W
DCW  CHR1TM     A TM, THEN 9 7S
      B  BSP
SW   BYPASS&1  DO ERROR CHECKING HERE
      B  RT      M XUN BUFR R
BEF1 *E7        SHOULD GET EOF IND
      ERROR 70 SW ERK70      CHECK FOR DC AND WLR
      BEX1 *E8,M
      B  *E7
      ERROR 71 SW ERK71
      C  BUFR&9,CHR1TM     ALL CHARS S/H XFERRD
      BE  *E7        REC READ EQUALS DATA
      ERROR 72 SW ERK72

*      READ RECORD 1ST CHAR 7, REST TMS

      B  MONITR
      B  WT
DCW  SQRUTS     A 7 AND 9 TMS
      B  BSP
SW   BYPASS&1  DO ERROR CHECKING HERE
      B  RT
BEF1 *E8
      B  *E7        SHOULD NOT GET EOF
      ERROR 73 SW ERK73
      BEX1 *E8,M
      B  *E7        CHECK FOR DC AND WLR
      ERROR 74 SW ERR74
      C  BUFR&9,SQRUTS
      BE  *E7
      ERROR 75 SW ERR75
*

```

TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

LABEL OPCOD OPERAND

• *TEST FOR ERASE FORWARD DURING
 • BACKSPACE AFTER WRITE STATUS

B	MONITR	7	05217	J	01841
B	WT	7	05224	J	07027
DCW	TEN1S	5	05235		08690
C	WTBEM	7	05236	J	07099
DCW	COLSEQ	5	05247		08824
B	BSP	7	05248	J	06894
B	BSP	7	05255	J	06894
B	WT	7	05262	J	07027
DCW	TEN2S	5	05273		08700
B	BSP	7	05274	J	06894
B	RT	7	05281	J	07420
C	BUFER&9,TEN2S	11	05288	C	09409 08700
BE	*&7	7	05299	J	05312 S
ERROR 76	SW ERK76	6	05306		00277
MLNA	C00586,RECLN	12	05312	D	01105 00049 /
SW	BYPASS&1	6	05324		07651
B	RTB	7	05330	J	07438
C	BUFER&9,LABEL	11	05337	C	09409 09399
BU	*&7	7	05348	J	05361 /
ERROR 77	SW ERK77	6	05355		00278

WT-WTB-BSP-BSP RE WT-BSP-RT-RTB
 OK 1 ST PORTION OF 2 NO RECORD GONE

TAPE OPERATIONS TEST

T020 INSTRUCTION

LABEL OPCODE OPERAND

* TEST FOR B-REG BIT PICK UP
* AND A-REGISTER DROP OUT
* WRITE ODD-READ EVEN- TEST FOR *S

WTBPUR	B	MONITR	7	05361	J 01841
	B	RWD	7	05368	J 06875
	S	RECNO	6	05375	S 09393
	A	ONE,RECNO	11	05381	A 08681 09393
	B	WTR	7	05392	J 07045
	DCW	ALTBIT	5	05403	08688
	BCE	WTBPUR,RECNO-3,0	12	05404	B 05381 09390 0
	B	RWD	7	05416	J 06875
	S	BPUCNT	6	05423	S 01172
	CS	WKAREA	6	05429	/ 00163
	SW	WKAREA-63	6	05435	, 00100
	MLCS	CHCON&7,WKAREA	12	05441	D 01515 00163 J
	MLCB	WKAREA,WKAREA-1	12	05453	D 00163 00162 L
	CW	PICKOC&1	6	05465	D 08670
	SAR	SXR3	7	05471	G 00064 A
ZEROIT	S	0&SXR3	6	05478	S 00:00
	SAR	SXR3	7	05484	G 00064 A
	S	TWO,SXR3	11	05491	S 08691 00064
	BW	ZEROIT,1&SXR3	12	05502	V 05478 00:01 1
	S	RECNT1	6	05514	S 01153
ROBPUR	BCE	REPORT,RECNT1-3,1	12	05520	B 06126 01150 1
	SW	BYPASSE&1	6	05532	, 07651
	B	RT	7	05538	J 07420
	A	ONE,RECNT1	11	05545	A 08681 01153
	BEX1	*&8,1	7	05556	R 05570 1
	B	CK4AST	7	05563	J 05596
ERROR 80	SW	ERR80	6	05570	, 00281
	SW	CK4LUP&1	6	05576	, 01870
	B	MONITR	7	05582	J 01841
	B	ROBPUR	7	05589	J 05520

SKIP CHKS IF IND SET

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
•		CHECK BUFR SECTION BY SECTION			
CK4AST	SW	BUFR1, BUFR9	11	05596	09410 09922
	MLWB	BUFR9, BUFR8	12	05607	0 09922 09858 M
	SW	BUFRNO&1	6	05619	09986
	SAR	SXR3	7	05625	G 00064 A
CK4MOR	C	SXR3, C09410	11	05632	C 00064 01110
	BH	ROBPUR	7	05643	J 05520 U
	C	0&SXR3, WKAREA	11	05650	C 00000 00163
	SAR	SXR3	7	05661	G 00064 A
	BE	CK4MOR	7	05668	J 05632 S

FINO CHARACTERS INVOLVED

•					
ND0SEC	MLNB	SXR3, HOLOIT	12	05675	0 00064 01162 J
	SW	ALTBIT&1	6	05687	08889
	SAR	SXR4	7	05693	G 00069 A
	A	C00064, SXR3	11	05700	A 01100 00064
	C	SXR3, HOLOIT	11	05711	C 00064 01162
	BE	CK4MOR	7	05722	J 05632 S
SCNFLO	SCNLS	0&SXR3, 0&SXR4	12	05729	0 00000 00000
	SAR	SXR3	7	05741	G 00064 A
	SBR	SXR4	7	05748	G 00069 B
	BCE	ND0SEC, 1&SXR3, *	12	05755	B 05711 00001 *
	A	ONE, BPUCNT	11	05767	A 08681 01172
	BCE	TOMANY, BPUCNT-4, 1	12	05778	B 06107 01168 1

MORE THAN 9999

LABEL	OPCODE	OPERAND	TAPE OPERATIONS TEST	CT	ADDRS	INSTRUCTION	PAGE
		ANALYZE BITS PICKED UP OR DROPPED					
	CW	HAFWAY61,PICKUP61	SET SWITCHES	11	05790	D 05883 05955	
	S	ERRCNT	ZERO COUNTER	6	05801	S 08670	
	SW	PICK0861	SET ADDR FOR START	6	05807	, 08664	
	SAR	SXRA	OF TALLEY TABLE	7	05813	G 00074 A	
	SW	1ESXR4	NEED IT FOR LOOK UP	6	05820	, 00.1	
	LE	1ESXR4,8ITABL	FIND CHAR WRITTEN	12	05826	T 00.1 06106 2	
	SBR	SXRB		7	05838	G 00079 B	
	CW	1ESXR4		6	05845	D 00.1	
MOVBIT	MLCS	0ESXR8,BITCHK611	MOVE BIT FOR TESTING	12	05851	D 00.M0 05881 3	
	SAR	SXRB		7	05863	G 00079 A	
BITCHK	BRE	PICKUP,1ESXR3,	TEST BITS IN CHAR RD	12	05870	H 05954 00.01	
HAFWAY	NOPWM			1	05882	N	
	BRE	ADDONE,1ESXR8,M ^G		12	05883	H 05962 00.M1 M	
CHK4WM	BW	CHKONG,0ESXR8,		12	05895	V 05991 00.MU 1	
	S	BITCHK,SXRA	SUB 6,STEP TO NEXT TALLEY	11	05907	S 05870 00074	
	C	SXRA,HAFDUN	1/2 WAY THRU TABLE	11	05918	C 00074 01167	
	BU	MOVBIT	CONT PICKUP TEST	7	05929	J 05851 /	
	SW	HAFWAY61,PICKUP61	SET FOR DROPOUT TEST	11	05936	, 05883 05955	
	B	CHK4WM		7	05947	J 05895	
PICKUP	NOPWM			1	05954	N	
	B	CHK4WM	TEST FOR LAST PLACE	7	05955	J 05895	
ADDONE	A	ONE,0ESXRA	ADD 1 TO TALLEY	11	05962	A 08681 00.0	
	A	ONE,ERRCNT	ADD 1 TO ERROR COUNT	11	05973	A 08681 08670	
	B	CHK4WM	TEST FOR LAST PLACE	7	05984	J 05895	

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
CHKDNC	BBE	NDOSEC,ERRCNT,1	12	05991	W 05711 08670 1
	BCE	LOSTAC,0&SXR3,C	12	06003	B 06033 00.00 C
	A	ONE,PICKDC	11	06015	A 08681 08669
	B	NDOSEC	7	06026	J 05711
LOSTAC	A	DNE,DRUPDC	11	06033	A 08681 08627
	B	NDOSEC	7	06044	J 05711
	DCW	2C 4 B 12 8 -U2	14	06064	
		2 2 8 -1 4 B 2	14	06078	
		2 1 4 B 2 8 -V2	14	06092	
BITABL	DCW	2C12 8 - 4 B 2	14	06106	
TOMANY	SW	ERK81	6	06107	, 00282
	SW	CK4LUP21	6	06113	, 01870
	B	MDNIIR	7	06119	J 01841
REPORT	SW	PICKDC11	6	06126	, 08670
	SAR	SXR3	7	06132	G 00064 A
NXTOTL	MLCB	0&SXR3,BITALLY	12	06139	D 00.00 06190 L
	SAR	SXR3	7	06151	G 00064 A
	C	BITALLY,COUNT0	11	06158	C 06190 08754
	BE	DDNTYP	7	06169	J 06192 S
	B	TYPEIT	7	06176	J 09344
	DCW	2* 2	2	06184	
BITALLY	DCW	2 a,G	6	06190	
DONTYP	BW	NXTOTL,1&SXR3	12	06192	V 06139 00.01 1

TAPE OPERATIONS TEST

CT ADDRS INSTRUCTION

OPCOD OPERAND

LABEL

• *WRITE & READ 1000 RECORDS
 • ALTERNATE BIT PATTERNS
 • RIPPLE WRITE TRIGGER FREQUENCY TEST

NXTREC	B	MONITR	7	06204	J	01841
	B	RWD	7	06211	J	06875
	S	RECNO	6	06218	S	09393
	A	ONE,RECNO	11	06224	A	08681 09393
	B	WTB	7	06235	J	07045
	DCW	CALTBIT	5	06246		08888
	BCE	NXTREC,RECNO-2,0	12	06247	B	06224 09391 0
	B	SKP	7	06259	J	06932
RECYCL	SW	FREQ1&1	6	06266		01230
	SAR	SXK4	7	06272	G	00069 A
WTMORE	MLCB	06SXR4,TSTPAT	12	06279	D	00.40 06320 L
	SAR	SXR4	7	06291	G	00069 A
	A	ONE,RECNO	11	06298	A	08681 09393
	B	WTB	7	06309	J	07045
TSTPAT	DCW	CHTFTPI	5	06320		08952
	BW	WTMORE,1&SXR4	12	06321	V	06279 00.41 1
	BCE	RECYCL,RECNO-3,0	12	06333	B	06266 09390 0
	B	RWD	7	06345	J	06875
	S	RECNT1	6	06352	S	01153
RDMORE	BCE	RDDONE,RECNT1-3,1	12	06358	B	06554 01150 1
	MLNB	BUFER&3,SAVEIT	12	06370	D	09403 01176 J
	B	RTN	7	06387	J	07434
	A	ONL,RECNT1	11	06389	A	08681 01153
	C	BUFER&3,RECNT1	11	06400	C	09403 01153
	BE	RDMORE	7	06411	J	06358 S
	C	BUFER&3,SAVEIT	11	06418	C	09403 01176
	BU	CKAHD	7	06429	J	06462 /
ERROR 82	SW	ERR82	6	06436		00283
	SW	CK4LUP&1	6	06442		01870
	B	MONITR	7	06448	J	01841

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
	B	RDMORE	7	06455	J 06358
CKAHEAD	S	RECNT2	6	06462	S 01157
UPONE	A	ONE,RECNT1	11	06468	A 08681 01153
	A	ONE,RECNT2	11	06479	A 08681 01157
	C	BUFERC3,RECNT1	11	06490	C 09403 01153
	BE	OUTSEQ	7	06501	J 06522 S
	BZ	NOHERE	7	06508	J 06548 V
	B	UPONE	7	06515	J 06468
OUTSEQ	SW	ERR83	6	06522	, 00284
	SW	CK4LUPC1	6	06528	, 01870
	B	MONITR	7	06534	J 01841
	B	RDMORE	7	06541	J 06358
NOHERE	SW	ERR84	6	06548	, 00285
ROONE	B	MONITR	7	06554	J 01841
.					*****

TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

OPCODE OPERAND

LABEL

*SPACE,DELAY AND TEST FOR T.I. ON

SPACE	SBR	RETURN	7	06792	G 00039 B
	CU	XU1,A	5	06799	U XU1 A L
	BEX1	*X8,B	7	06804	R 06818 B G
	BAL	*-18	7	06811	R 06799 H
	SW	TISW	6	06818	, 01192
	CW		1	06824	□
	S	DLACNT	6	06825	S 01184
	A	TIMEL,DLACNT	11	06831	A 01178 01184
	BTI	*X20	7	06842	J 06868 K
	BCE	*-29,DLACNT-5,0	12	06849	B 06831 01179 0
	CW	TISW	6	06861	□ 01192
	SW		1	06867	, Q
	B	0XRETURN	7	06868	J 000M0

RETURN TO MAIN LINE

TAPE OPERATIONS TEST					T020
LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
*		ALTER U.C. INSTRUCTION IN UTILITY			
*		U.C. ROUTINE TO INSTRUCTION REQUESTED			
RWD	SBR	RETURN	7	06875	G 00039 B
	B	UCONRT	7	06882	J 06951
	DCW	00XUIR0	5	06893	
		STORE ADDRESS FOR RETURN TO UNIT CONTROL ROUTE INSTRUCTION REQUESTED			
BSP	SBR	RETURN	7	06894	G 00039 B
	B	UCONRT	7	06901	J 06951
	DCW	00XUIB0	5	06912	
		NORMAL BACK SPACE			
WTM	SBR	RETURN	7	06913	G 00039 B
	B	UCONRT	7	06920	J 06951
	DCW	00XUIA0	5	06931	
SKP	SBR	RETURN	7	06932	G 00039 B
	B	UCONRT	7	06939	J 06951
	DCW	00XUIE0	5	06950	
*		*UNIT CONTROL ROUTINE			
		STORE OP REQUESTED			
UCONRT	SBR	SXR3	7	06951	G 00064 B
	MLCWB	40SXR3,UCONOP04	12	06958	D 00.04 06974 P
UCONOP	BSP	11	5	06970	U XUI B
	MLCB	WHAT,WHAT-1	12	06975	D 08242 08241 L
	MLCA	UCONOP04,WHAT-6	12	06987	D 06974 08236 I
	B	TST4DL	7	06999	J 07862 L
	BEX1	*08.0	7	07006	R 07020 B
	BAL	UCONOP	7	07013	R 06970 M
	B	MERGE	7	07020	J 07630
		GO SEE ABOUT OVERLAP BRANCH ON 1/4/8/A/B TRY AGAIN IF BUSY CONT IN COMMON RT			

*UNIT CONTROL ROUTINE

STORE OP REQUESTED

SET OP REQ IN PLACE

U.C. INST- VARIABLE

BLANK FIELD

SET INST IN ERR MSGE

GO SEE ABOUT OVERLAP

BRANCH ON 1/4/8/A/B

TRY AGAIN IF BUSY

CONT IN COMMON RT

TAPE OPERATIONS TEST

LABEL	OPCOO	OPERANO	CT	ADRS	INSTRUCTION
•		ALTER WRITE INSTRUCTION IN UTILITY			
•		WRITE ROUTINE TO INSTRUCTION REQUESTED			
WT	SBR	DATA	7	07027	G 00044 B
	B	SETOP	7	07034	J 07142
	DCW	2M2U12	4	07044	
WTB	SBR	DATA	7	07045	G 00044 B
	B	SETOP	7	07052	J 07142
	DCW	2M2B12	4	07062	
WTW	SBR	DATA	7	07063	G 00044 B
	B	SETOP	7	07070	J 07142
	DCW	2LXU12	4	07080	
WTBW	SBR	DATA	7	07081	G 00044 B
	B	SETOP	7	07088	J 07142
	DCW	2LX812	4	07098	
WTBEW	SBR	DATA	7	07099	G 00044 B
	MLCS	COLSEQ-12,WRITE69	12	07106	D 08812 07372 3
	NOP	OVRLAP ON 7010 ONLY	1	07118	N
WTEOSW	MLCS	CHCON-42CHSTCT,WTEOP-2 SET FOR UN-OL	12	07119	O 01EM4 07139 3
	B	SETOP	7	07131	J 07142
	DCW	2LX812	4	07141	
WTEOP	SBR	DATA	7	07142	G 00064 B
	MLCA	32SXR3,WRITE63	12	07149	D 00.03 07366 1
	CW	62DATA	6	07161	2 00+06
	SAR	RETURN	7	07167	G 00039 A

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
•		CHECK FOR LABEL, FILL BUFR COMPLETELY			
	S	RECLN	6	07174	S 00049
	MLNA	C00010,RECLN	12	07180	D 01095 00049 /
	BZN	SETEND,4,DATA,	12	07192	V 07240 00104 2
	MLNA	C00064,RECLN	12	07204	D 01100 00049 /
	BZN	SETEND,4,DATA,B	12	07216	V 07240 00104 K
	MLNA	C00586,RECLN	12	07228	D 01105 00049 /
SETEND	B	CLEAR	7	07240	J 07825
	SW	BUFR,BUFR9	11	07247	• 09400 09922
	MLNA	4,DATA,*66	12	07258	D 00104 07275 /
	MLCWB	00000,BUFR-1,RECLN	12	07270	D 00000 09179 P
	BZN	ALABEL,4,DATA,6	12	07282	V 07307 00104 B
	CW	BUFR	6	07294	D 09400
	B	8PRIMW	7	07300	J 07344
ALABEL	MLCWB	BUFR-1,RECLN,BUFR9-1	12	07307	D 09129 09921 P
C	MLNA	RECLN,LENGTH	12	07319	D 00049 09398 /
	MLCA	LABEL,BUFR69	12	07331	D 09399 09409 T
C	NOP		1	07343	N

•WRITE ROUTINE

8PRIMW	NOPWM		1	07344	N
	MLCA	8PRIME,WRITE68	12	07345	D 01125 07371 T
	CW	8PRIMW61	6	07357	D 07345
WRITE	WT	11,BUFR	10	07363	M 801 09400 W
	SBR	XAREDT	7	07373	G 00059 B
	MLCA	WRITE69,WHAT-1	12	07380	D 07372 08241 I
	B	TST4OL	7	07392	J 07862
	BEX1	*68,B	7	07399	R 07413 B
	BAL	WRITE	7	07406	R 07363 M
	B	MERGE	7	07413	J 07630
•					*****

TAPE OPERATIONS TEST

T020 PAGE 56

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
*		ALTER READ INSTRUCTION IN UTILITY			
*		READ ROUTINE TO INSTRUCTION REQUESTED			
RT	SBR	RETURN	7	07420	G 00039 B
	B	READER	7	07427	J 07535
	DCW	2M%U12	4	07437	
RTB	SBR	RETURN	7	07438	G 00039 B
	B	READER	7	07445	J 07535
	DCW	2M%B12	4	07455	
RTW	SBR	RETURN	7	07456	G 00039 B
	B	READER	7	07463	J 07535
	DCW	2L%U12	4	07473	
RTBW	SBR	RETURN	7	07474	G 00039 B
	B	READER	7	07481	J 07535
	DCW	2L%B12	4	07491	
RTBGW	SBR	RETURN	7	07492	G 00039 B
	MLCS	COLSEQ-56,READ29	12	07499	D 08768 07589 3
	NOP	OVRLAP ON 7010 ONLY	1	07511	N
	MLCS	CHCON-4&CHSTCT,RTEOP-2 UN-OL READ EOM	12	07512	D 01EM4 07532 3
	B	READER	7	07524	J 07535
	DCW	2L%B12	4	07534	
		INSTRUCTION REQUEST			
*		READ ROUTINE			
READER	SBR	SXR3	7	07535	G 00064 B
	MLCA	3CSXR3,READ23	12	07542	D 00.03 07583 1
	B	CLEAR	7	07554	J 07825
	NOPWM		1	07561	N
BPRMR	MLCA	BPRIME,READ28	12	07562	D 01125 07588 1
	CW	BPRMR21	6	07574	D 07562
		SET NEW READ ADDR			
		CLEAR SW			
		STORE ADDR OF OP			
		SET OP REQ IN PLACE			
		CLEAR BUFR-SET GMMW AT END			

059

TO20 INSTRUCTION

TAPE OPERATIONS TEST

OPCOD OPERAND

LABEL

READ	RT	11.BUFR	M/L XXN BUFR R U/B	10	07580	M	2U1 09400	H
	SBR	XAREOT	B-REG, END OF X-FER	7	07590	G	00059	B
	MLCA	READG9.WHAT-1	SET INST IN ERR MSGE	12	07597	U	07589 08241	T
	B	TST4OL	GO SEE ABOUT OVERLAP	7	07609	J	07862	L
	BEX1	*E8.B	BRANCH ON 1/4/8/A/B	7	07616	R	07630	B
	BAL	READ	TRY AGAIN IF BUSY	7	07623	R	07580	M

TAPE OPERATIONS TEST

T020 PAGE 58

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
•		WRITE,READ & U.C. ROUTINES MERGE AND			
•		CONTINUE TESTING IN COMMON ROUTINE			
MERGE	BCE	*L8,TAD5,1	12	07630	B 07649 01005 1
	B	*L2	7	07642	J 07650
	H		1	07649	.
BYPASS	NOPWM		1	07650	N
	B	RESTOR	7	07651	J 07762
	CW	RWD5H0L1	6	07658	D 08314
	BAL	TSTIND	7	07664	R 07931 M
	BCE	RESTOR,TAD4,1	12	07671	B 07762 01004 1
•		TESTING OVERLAP OPERATION - PHASE 2			
•		PHASE 1 DONE IN TST40L ROUTINE			
CKOLAP	BCE	TSTD4M,WHAT-10,U	12	07683	B 07707 08232 U
TESTX1	BCE	CK40IP,WHAT-9,	12	07695	B 07744 08233
TSTD4M	BCE	CK40IP,WHAT-6,M	12	07707	B 07744 08236 M
	BW	RESTOR,OIPSW-1	12	07719	V 07762 01193 1
ERROR 99	SW	ERR99	6	07731	, 00300
	B	RESTOR	7	07737	J 07762
CK40IP	BW	RESTOR,OIPSW	12	07744	V 07762 01194 1
ERROR 98	SW	ERR98	6	07756	, 00299
•		END OF OVERLAP TESTING			
RESTOR	CW	BYPASSL1	6	07762	D 07651
	S	DCCNT	6	07768	S 01148
	S		1	07774	S
	MLCA	STDWRT,WRITEL9	12	07775	D 07818 07372 1
	MLCA	STDRDT,READL9	12	07787	D 07824 07589 1
	BNQ	CONTRL	7	07799	J 01010 Q
	B	0LRETURN	7	07806	J 000M0
•		*****			
STDWRT	DCW	209400W2	6	07818	
STDRDT	DCW	209400R2	6	07824	

TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
•		•UTILITY SUB-ROUTINES			
•		CLEAR OUT INPUT-OUTPUT AREA			
•		SET GM-WM AT END OF DATA FIELD			
CLEAR	SBR	CLRXT65	7	07825	G 07860 B
	CS	BUFRND61	6	07832	/ 09986
	CS		1	07838	/ 09986
	CS		1	07839	/ 09986
	CS		1	07840	/ 09986
	CS		1	07841	/ 09986
	CS		1	07842	/ 09986
	MLCWS	GMWM, BUFRND61, CLR	12	07843	D 01009 09040 7
CLRXT	B	00000	7	07855	J 00000
•					
•					
•					
TST40L	SBR	OLTXIT65	7	07862	G 07929 B
	BCE	OLTXIT, TAD4, 1	12	07869	B 07924 01004 1
	CW	OIPSW	6	07881	D 01194
	SW		1	07887	/
	BOL1	OIP	7	07888	J 07902 1
	B	OLTXIT	7	07895	J 07924
	SW	OIPSW	6	07902	/ 01194
	CW		1	07908	/
OIP	BOL1	•-6	7	07909	J 07909 1
	NOPWM		1	07916	N
AREOTO	SER	XAREOT	7	07917	G 00059 E
OLTXIT	B	00000	7	07924	J 00000

TEST OVERLAP IN PROCESS - PHASE 1

SAVE FOR RETURN
DO NOT TEST OVERLAP
RESET OLAP TEST SW
OIPSW OFF, OIPSW-1, ON
BRANCH ON OVERLAP
DID NOT BOL
SET SW TO IND OLAP
OIPSW ON, OIPSW-1 OFF
HANG AROUND ON OIP
DONT STORE E IIL SET
ADDR AT END OF X-FER
RETURN

TAPE OPERATIONS TEST

T020 PAGE 60

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
•		TEST ALL STATUS INDICATORS			
•					
TSTIND	MLCA	ALLIND,INDSET	12	07931	D 01146 08248 T
	BNR1	*E13	7	07943	R 07962 1
	MLCS	ABLANK,INDSET-5	12	07950	D 08249 08243 3
	RCR1	*E13	7	07962	R 07981 2
	MLCS	ABLANK,INDSET-4	12	07969	D 08249 08244 3
	BER1	*E13	7	07981	R 08000 4
	MLCS	ABLANK,INDSET-3	12	07988	D 08249 08245 3
	BEF1	*E13	7	08000	R 08019 8
	MLCS	ABLANK,INDSET-2	12	08007	D 08249 08246 3
	BWL1	*E13	7	08019	R 08038 -
	MLCS	ABLANK,INDSET-1	12	08026	D 08249 08247 3
	BNT1	*E13	7	08038	R 08057 8
	MLCS	ABLANK,INDSET	12	08045	D 08249 08248 3
	BCE	CK4HLT,TAD8,1	12	08057	B 08281 0100H 1
	B	ERRCTL	7	08069	J 08188
•					
•		•CHECK FOR ERROR MESSAGES			
•					
CK4HMS	SW	ERR99E1	6	08076	, 00301
	SAR	SXR3	7	08082	G 00064 A
	CW	LASTWME1	6	08089	D 08115
SCN4ER	SCNLB	09999,0ESXR3	12	08095	D 09999 00.00 -
	SBR	SXR3	7	08107	G 00064 B
LASTWM	NOPWM		1	08114	N
	BCE	NOMDWM,1ESXR3,M ^G	12	08115	B 08268 00.01 M ^G
	BCE	CK4LUP,1ESXR3,M ^G	12	08127	B 01869 00.01 M ^G
	SW	LASTWME1	6	08139	, 08115
	CW	1ESXR3	6	08145	D 00.01
	MLCB	ABLANK,INDSET	12	08151	D 08249 08248 L
	MLCB		1	08163	D
	MLNB	SXR3,INDSET-4	12	08164	D 00064 08244 J
	MLCA	LError,WHAT-6	12	08176	D 01140 08236 T
		SET ERROR IN ERROR MESSAGE			

TAPE OPERATIONS TEST

T020 PAGE 61

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
•		•ERROR CONTROL ROUTINE			
•					
ERRCTL	BCE	CK4HLT,TADD,1	12	08188	B 08281 01000 1
	MLNB	SXR2,WHERE	12	08200	D 00034 08254 J
	S	SEVEN,WHERE	11	08212	S 08731 08254
	B	TYPEIT	7	08223	J 09344
	DCW	2* 2	7	08236	
WHAT	2	2	6	08242	
INDSET	2	2	6	08248	
ABLANK	2	2	1	08249	
WHERE	2000002,G		5	08254	
	BW	SCN4ER,LASTWM21	12	08256	V 08095 08115 1
NOMOWM	CW	LASTWM21	6	08268	0 08115
	BNQ	CONTRL	7	08274	J 01010 Q
CK4HLT	BCE	HALT,TADD2,1	12	08281	B 08300 01002 1
	B	HALT21	7	08293	J 08301
HALT	H		1	08300	*
	BCE	AWMSET,WHAT-10,E	12	08301	B 08376 08232 E
RWDSWO	NOPWM		1	08313	N
	B	NEXTD	7	08314	J 06665
	BCE	EDFRT,INDSET-2,8	12	08321	B 08449 08246 8
	BCE	NRDYRT,INDSET-5,1	12	08333	B 08425 08243 1
	BCE	DCERRT,INDSET-3,4	12	08345	B 08463 08245 4
	BCE	WLROUT,INDSET-1,B	12	08357	B 08493 08247 B
	B	RESTOR	7	08369	J 07162
AWMSET	BCE	CTERNO,INDSET-5,0	12	08376	B 08395 08243 0
	B	CK4LUP	7	08388	J 01869
CTERNO	A	ONE,WMERCT	11	08395	A 08681 01147
	BCE	NRDYRT,WMERCT,3	12	08406	B 08425 01147 3
	B	OC5XR2	7	08418	J 000.0
					REPEAT ROUTINE

TAPE OPERATIONS TEST

T020 PAGE 62

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
•		•ERROR ROUTINES			
•					
•		NOT READY ROUTINE			
•					
NRDYRT	B	TYPEIT	7	08425	J 09344
	DCH	2* DROPPED,G	9	08440	
	B	NEXTDR	7	08442	J 01696
•					
•		END OF FILE ROUTINE - WHILE WRITING			
•					
EOFRT	B	RWD	7	08449	J 06875
	B	06SXR2	7	08456	J 00050
•					
•		DATA CHECK ERROR ROUTINE			
•					
DCERRT	A	ONE,DCCNT	11	08463	A 08681 01148
	BCE	RESTOR,DCCNT,3	12	08474	B 07762 01148 3
	B	WHERE2	7	08486	J 08516
•					
•		WRONG LENGTH RECORD ROUTINE			
•					
WLROUT	A	ONE,WLRCNT	11	08493	A 08681 01149
	BCE	RESTOR,WLRCNT,3	12	08504	B 07762 01149 3
•					
WHERE2	BSP	11	5	08516	U XUI H
	BEX1	•68,B	7	08521	R 08535
	BAL	•-18	7	08528	R 08516 M
	SKP	10	5	08535	U XU0 E
	BEX1	•68,B	7	08540	R 08554
	BAL	•-18	7	08547	R 08535 M
	BCE	WRITE,WHAT-1,M	12	08554	B 07363 08241 W
	BCE	READ,WHAT-1,R	12	08566	B 07580 08241 R
	B	UCONOP	7	08578	J 06970
UPREND	H		1	08585	.

T020 INSTRUCTION

TAPE OPERATIONS TEST

LABEL OPCOD OPERAND

TALLEY TABLE FOR BITS DROPPED

•	DC	01-0	2	08587
	DROPD1	0	4	08591
		02-0	2	08593
	DROPD2	0	4	08597
		04-0	2	08599
	DROPD4	0	4	08603
		08-0	2	08605
	DROPD8	0	4	08609
		0A-0	2	08611
	DROPDA	0	4	08615
		0B-0	2	08617
	DROPDB	0	4	08621
		0C-0	2	08623
	DROPDC	0	4	08627

TALLEY TABLE FOR BITS PICKED UP

•	DC	01 0	2	08629
	PICKD1	0	4	08633
		02 0	2	08635
	PICKD2	0	4	08639
		04 0	2	08641
	PICKD4	0	4	08645
		08 0	2	08647
	PICKD8	0	4	08651
		0A 0	2	08653
	PICKDA	0	4	08657
		0B 0	2	08659
	PICKDB	0	4	08663
		0C 0	2	08665
	PICKDC	0	4	08669
	ERRCNT	0 0	1	08670

LABEL	OPCODE	OPERAND	TAPE OPERATIONS TEST	CT	ADDRS	T020 INSTRUCTION
	DC	a a	A C 8IT	1	09337	
	DCW	a-a	A B 8IT	1	09338	
	DCW	a8a	AN A 8IT	1	09339	
	DCW	a8a	AN 8 8IT	1	09340	
	DCW	a4a	A 4 8IT	1	09341	
	DCW	a2a	A 2 8IT	1	09342	
AlBIT	DCW	a1a		1	09343	

TYPING ROUTINE

TYPEIT	S8R	TYPE&8	STORE ADDRESS OF MESSAGE	7	09344	G	09359	B	
TYPE	WCP	00000	TYPE MESSAGE	10	09351	M	210	00000	M
	S8R	TYPEXT&5	STORE ADDRESS FOR RETURN	7	09361	G	09387	8	
	8CB1	TYPE		7	09368	K	09351	2	
	BA1	*&1	RESET INTERLOCK	7	09375	R	09382	M	
TYPEIT	B	00000	RETURN TO MAIN PROGRAM	7	09382	J	00000		
	H		DEFINE PRECEDING BRANCH LENGTH	1	09389	.			
	DRG	9390							
RECNO	DCW	200002	RECORD NUMBER	4	09393				
LENGTH C	DC	2000002	RECORD LENGTH	5	09398				
LABEL	DC	2+2	LABEL FOR LONG RECS	1	09399				

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
•		INITIALIZATION- ONE TIME ONLY			
•		THIS AREA IS ALSO THE BUFFER AREA			
•		IT WILL BE CLEARED OUT WHEN SETUP IS DONE			
SETUP	ORG	9400		09400	
	CS	332	6	09400	/ 00332
	CS		1	09406	/
	CS		1	09407	/
	CS		1	09408	/
	SW	95,20	11	09409	, 00095 00020
	MLWB	95,90	12	09420	D 00095 00090 M
	MRCW	RESET1-6,1	12	09432	D 09694 00001 M
	MRCW		1	09444	D
	MRCW		1	09445	D
	MRCW		1	09446	D
	MLCWS	GMWM,ERROR1-2	12	09447	D 01009 00200 7
	B	TYPEIT	7	09459	J 09344
C	DCW	21020C2,G	5	09470	

CHECK SYSTEMS CARD FOR INFO NEEDED

•					
BCE	NOSYS1,SYSL,	NO SYSTEM CARD	12	09472	B 09704 01256
B8E	HOWBIG,SYSL,-	TEST FOR T010	12	09484	W 09525 01256 -
CW	WTEOSW61,RTGOSW61	OVRLAP WT-RT EOM OK	11	09496	D 07119 07512
SW	G0210K61	ROUTINE ABOVE 10K IF T010	6	09507	, 04249 D
MRCWG	TOTENK,ODEVN1	MOVE ROUTINE ABOVE 10K	12	09513	D 09735 10000 L
A	SYSL61,EOMAN1-4	SET UP END OF MEMORY	11	09525	A 01257 01126
A	ONE,EOMAN1	MAKE CONST EQU EOM61	11	09536	A 08681 01130 G
B8E	*67,EOMAN1-4,T	BR IF NOT A 10K SYSTEM	12	09547	W 09565 01126 Y
S	EOMAN1	SET TO 00000- WKAP-AROUND ADDRESS	6	09559	S 01130
A	SYSL61,WIEADR-4	SET X-REG EQU EOM-10	11	09565	A 01257 01131
BCE	*613,SYSL67,1	OVERLAP AVAILABLE	12	09576	B 09600 01263 1
MLNS	ONE,TAD4	-N/A DONT TEST OLAP	12	09588	D 08681 01004 1
A	ONE,CHANOS	CHAN 1 ALWAYS THERE	11	09600	A 08681 00020
BCE	*612,SYSL613,		12	09611	B 09634 01269
A	TWO,CHANOS61	CHANNEL 2 AVAILABLE	11	09623	A 08691 00021
BCE	*613,SYSL614,	CHANNEL 3 N/A	12	09634	B 09658 01270

T020 INSTRUCTION

TAPE OPERATIONS TEST

LABEL OPCOD OPERAND

MLNS THREE,CHANOS&2
BCE *&12,SYS1&15,
A FOUR,CHANOS&3

CW START&1
B START

RESET1 DCW &J000,0 &
&. &
& &
& &

NOSYS1 B TYPEIT
DCW &NO SYS CRO&,G
H SETUP
H
DC & &

ODEVN1 EQU 10000
ODEVN2 EQU ODEVN1&105

12 09646 D 08744 00022 1
12 09658 B 09681 01271
11 09670 A 08701 00023

6 09681 & 02001
7 09687 J 02000

7 09700
1 09701
1 09702
1 09703

7 09704 J 09344
10 09720
6 09722 . 09400
1 09728 .
6 09734

NO SYSTEM CARD-SEE SUMMARY PAGE 3
TRY AGAIN
FILL IN

ROUTINE ABOVE 10K FOR 7010

TAPE OPERATIONS TEST

T020

CT ADDR INSTRUCTION

OPCODE OPERAND

LABEL

* TEST FOR DATA TRANSFER FROM
 * ODD STARTING ADDR TO EVEN STOP AND
 * ODD STARTING ADDR TO ODD STOP ADDR

TOTENK	B	MONITR	7	09735	J 01841
	MLNA	2094012,88888	12	09742	D 09999 00054 /
	SW	BPRIMWEL	6	09754	, 07345
	B	WT	7	09760	J 07027
	DCW	DIGITS	5	09771	08750
	C	XAREOT,C09411	11	09772	C 00059 01115
	BE	ODEVN1C61	7	09783	J 10061 S
ERROR 85	SW	ERK85	6	09790	, 00286
	B	BSP	7	09796	J 06894
	SW	BPRIMREL	6	09803	, 07562
	D	RT	7	09809	J 07420
	C	XAREOT,C09411	11	09816	C 00059 01115
	BE	ODEVN1C105	7	09827	J 10105 S
ERROR 86	SW	ERK86	6	09834	, 00287
	B	MONITR	7	09840	J 01841
	CS	WKAREA	6	09847	/ 00163
	MLCA	DIGITS-1,WKAREA-55	12	09853	D 08749 00108 T
	MLCWS	GMWM,WKAREA-54	12	09865	D 01009 00109 T
	MLNA	2094012,88888	12	09877	D 09999 00054 /
	SW	BPRIMWEL	6	09889	, 07345
	B	WT	7	09895	J 07027
	DCW	-WKAREA	5	09906	00163
	C	XAREOT,C09410	11	09907	C 00059 01110
	BE	ODEVN2C91	7	09918	J 10196 S
ERROR 87	SW	ERK87	6	09925	, 00288
	B	BSP	7	09931	J 06894
	MLNA	C00009,RECLEN	12	09938	D 01090 00049 /
	SW	BPRIMREL	6	09950	, 07562
	B	RT	7	09956	J 07420
	C	XAREOT,C09410	11	09963	C 00059 01110
	BE	ODEVN2C147	7	09974	J 10252 S

CTI

TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

T020

LABEL

OPCODE

OPERAND

ERROR 88

SW

ERR88

8

NEXTRT

G

2M2

2M2

.

LTORG

2094012

END

START

ATDNO

EQU

ROYTDS-1

UNITNO

EQU

CKDRIVE3

6 09981 00289

7 09987 J 04256

1 09994

09995

5 09999

RETURN TO REST OF TEST
